STEEL

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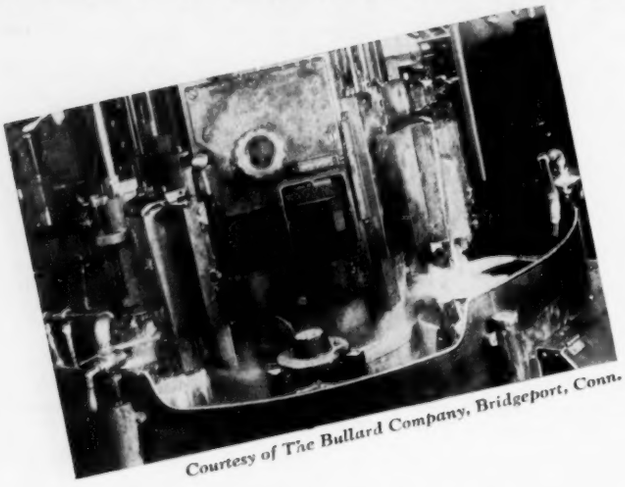
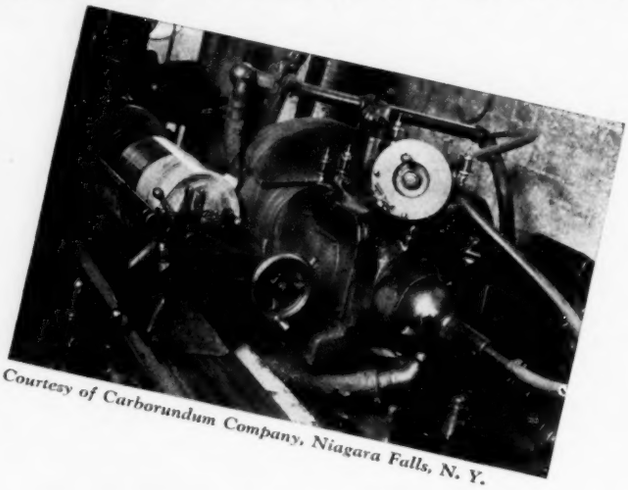


Courtesy of The Bullard Company, Bridgeport, Conn.

OPERATION: TURNING COMPANION FLANGE.
MACHINE: BULLARD MULT-AU-MATIC.
MATERIAL: STEEL FORGING.
SPEED: 78 FEET PER MINUTE.
DEPTH OF CUT: 3/16 INCH.
FEED: .018 INCH.
LUBRICANT: 1 PART SUNOCO TO 20 PARTS WATER.



Courtesy of Carborundum Company, Niagara Falls, N. Y.

OPERATION: GRINDING STEEL ROLL. 9 IN. DIAMETER, 18 IN. LONG.
MACHINE: LANDIS ROLL GRINDER, 12 IN. X 72 IN.
SCLEROSCOPE: 94 TO 101.
WHEEL SPEED: 1700 R. P. M.
WORK SPEED: 40 R. P. M.
COOLANT: 1 PART SUNOCO TO 30 PARTS WATER.

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Volume 92 Number 3

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

STATIONARY as business is today, transportation is an engrossing topic . . . . The business of transportation by automobile, premier consumer of steel, eagerly awaits the popular verdict on its new models, which will determine whether the encouraging December-January rate of assembly continues into February (p. 11). The new heights of artistry to which the fabrication of steel has risen in 1933 passenger cars, the extremely low prices and the greater values would seem to sate buyers for one season, but more is to come. There are the new Fords, probably including a series as low priced as Continental and Willys, and possibly a cheaply priced General Motors car . . . . Die cast parts have scored (p. 19) notable gains in these new models, both in trim and in unseen but vital mechanical parts.

Seek Lower Freight Rates on Auto Steel

Finished steel entering into the manufacture of these new automobile models will be moved by railroad to Detroit at reductions from present tariffs if producers of steel win the adjustment they put up to railroad rate associations at Pittsburgh, Jan. 13 (p. 9). From Pittsburgh to Detroit a decrease from 26.5 cents per 100 pounds to 18.5 cents is proposed as a means of preserving a maximum of this steel movement to the railroads. If the Pittsburgh rate, keystone of the arch, is reduced, comparable concessions from Johnstown, Buffalo, Chicago, Youngstown, Middletown, Cleveland and other automotive steel-producing centers will be in order to maintain differentials.

Cleaning, Pickling Handling Is Automatic

More prosaic, but transportation nevertheless, is the conveyor equipment which electric refrigerator manufacturers have installed in their cleaning and pickling departments, making them leaders in the enamelware industry to place these operations on an automatic basis (p. 17). The first conveyors used for this purpose were of the straight-line or continuous type, but later designs are of the dwell type, by which the conveyor dwells the load in each acid or rinse tank for the specified period. Adjustments are flexible, and during the dwell the acid bath is agitated violently to produce more effective action.

Still Want Youngstown a Port

Tireless in their efforts to canalize their rivers and transport their iron and steel by water, Youngstown interests urge (p. 10) army engineers to make a re-survey of their project, scaled down 70 per cent in cost, to about $30,000,000 . . . . When rivers and harbors enthusiasts meet in Washington this week (p. 22) they will take the offensive against the railroad

Heat and light are by-products of the electric furnace. Pouring a 4-ton coreless induction type unit, the product of the Ajax Electrothermic Corp., of Trenton, N. J.

program. . . . Cotton tie manufacturers have taken the offensive against imports, recommending (p. 10) that the 1-cent a pound duty be increased the full 50 per cent possible under the flexible provisions of the Hawley-Smoot tariff law.

Markets Shake Off Holiday Incubus

Inventory-taking and year-end shutdowns over, the iron and steel markets are emerging into a more normal period, operations (p. 35) rising to 17 per cent, best rate since late November. . . . Throughout the markets generally a better tone is evident (p. 27), no outlet except the automotive being outstanding. . . . Tin plate mills lead other departments of the industry (p. 30) with an activity of 50 per cent. . . . Japan is taking 30,000 tons of steel scrap from Baltimore (p. 39), planning to reincarnate dismantled shipping board vessels. . . . Statistics on British pig iron production for December disclose (p. 42) a gain of 200 tons daily and 60 stacks in blast, 18 more than in the United States, but in steel there was a slight decline.

Six Major Depressions Only an Incident

Founded when Old Hickory was in the White House, 28 years old when the Civil war broke, survivor of six major depressions, the Cooper-Bessemer Corp. this year is celebrating its centenary (p. 10). From a cupola blown by horsepower it has expanded to an $8,000,000 industry, noteworthy, among many products, for its gas compressors and diesel engines . . . . When the heavy crankshaft of a diesel engine broke recently it took two oxyacetylene welders only 2½ hours to repair (p. 23) the shaft for machining . . . . Equally efficient for destruction is the oxyacetylene process. In scrapping 2000 freight cars and reclaiming 31,500 tons of steel it was found (p. 23) that for cutting up all-steel gondolas 1150 cubic feet of oxygen and 290 cubic feet of acetylene were required.

Steel Producers Not House Contractors

Zealous as the steel industry is to promote the steel house as an outlet for its products, it will not step out of its role of producer into that of house building, is the assurance (p. 8) of a spokesman for the fabricating industry. But, he warns, only an organization familiar with the technique of steel can successfully erect an integrated unit. . . . In a survey of the market prospect, the probable reduction in structural steel tonnage due to a contraction of public work as budgets are pruned is noted (p. 7) in all districts . . . . Structural steel awards continue mediocre, this week's total of 6283 tons (p. 32) being below the weekly average for 1932.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Mixing Communism with Democracy

To the Editor:

I refer to your interesting editorial of Dec. 5 on the problem of unemployment and its causes.

It is natural that in a time of great anxiety each individual should indulge in introspection in an endeavor to analyze causes, and, if possible, to discover a remedy.

The natural mistakes of organized industry, however, should not be allowed to obscure the more obvious political causes of the present depression. To place the blame on the use of labor-saving machinery and mass production is a cheap political trick. It would be far more sensible to place the blame on short hours and high wages which prevail in the cities at the expense of our rural communities.

As I see it, the one common cause of trouble the world over is the effort of unintelligent politicians to mix communism with democracy.

We are suffering in this country from an over-production of laws and government regulation. These products of ignorant, but possibly well-meaning, politicians, unfortunately, do not seem to be subject to the inexorable laws of supply and demand which control industrial production. If a manager of a large industry overlooks his obligation in respect to the proper production of goods, and gets the idea he is running a welfare organization, competition soon puts him out of business. If, however, a politician thinks the government should run as a general employment agency he goes to the primary, and the voters who want jobs at the expense of the other voters see that he is elected.

There is so much loose talk going around about technological unemployment that it may be best to let it run its fool course. On the other hand it may do no harm to point out again that it is only by such displacement of labor that society can enjoy the benefits of labor-saving machinery. Where would we find the labor to build and operate our modern luxuries like golf courses, radios, cinemas, motor cars, beauty parlors, etc., if labor was not constantly being released from old line industries—manufacturing, transportation, agriculture.

But some unobserving person would, perhaps, try to make the point that there was some excess labor in the year preceding the depression. A little study of this question will show that such excess unemployment as may have existed at that time would easily be accounted for by our dole system. We are not supposed to have a public dole system as they have in England, but we have had for some years local community chests and city welfare departments which are disbursing more poor relief than Great Britain offers nationally.

The facts are that the percentage of citizens gainfully employed, both men and women, has steadily increased in the United States during the past 50 years. These simple and easily verified facts should be sufficient to stop most of the wild talk going around about the failure of organized industry to meet the reasonable requirements of society; but I shall take this opportunity to remind the critics of industry that machines are not provided by nature but require the labor of many people to produce them. This work of machine design and manufacture absorbs many of the graduates of our technical schools and is one of the most useful occupations. Since it multiplies human hands, it furnishes the foundation for most of the sciences which prolong life, and the arts, which improve our way of living.

JEROME R. GEORGE

Beverly Hills, Calif.

Slow, Gradual Improvement Is Diagnosis of Steel Markets

STEEL asked its editors in typical districts to survey the market prospect, and their reports are given herewith. Executives of the industry are conservative, but hopeful.

PITTSBURGH—First ray of cheer for the steel industry in the new year is the fact that the steel operating rate in this district did not pierce the 1932 low during the holiday period. Insignificant as the actual percentage was, the industry here has twice rebounded from a 10 per cent rate—once over July 4 and again over Christmas.

To a man, steel executives here exude caution and conservatism. But with the virtual certainty of some spring buying and the stubbornness with which the industry has resisted going below 10 per cent, executives seriously believe the industry to be on the threshold of a mild yet significant recovery.

Mild, because of impaired customer credits, low volume and irregular prices. Significant, because the year started from scratch and any change necessarily is upward.

One high executive reasons thus: Operations will rise to 18-20 per cent by mid-February and will touch a spring high of 30 per cent in March, then will come a summer dip and a fall rise, the dip less pronounced than a year ago and the rise greater.

In the first quarter of 1932 the Pittsburgh district opened at 25 per cent, dropped to 23 during February, rose to 25 in the first half of March, then began to slide.

Steel is banking on automobiles, tin plate and the small miscellaneous user as the foreguard of early 1933 improvement. The railroads may, on a deferred credit basis, enter the market. Structurals will feel the curtailment of government budgets and postoffice building programs. But to take the latter's place will be piling.

Producers expect the small order to be revived when the present political uncertainty lifts, possibly after March 4. There should be no underestimating the value of small orders. In September they boosted the ingot rate eight points. If each order were only a ton or two larger the rise in production would be surprising.

◆

DETROIT—Obviously due to the heavy runs of automobile manufacturers on new models for stocking dealers, the steel rate in this district is higher than the national average. The ten open-hearth steel furnaces of the Ford Motor Co. have been closed since last fall. However, of the six open hearths at the Great Lakes division of the National Steel Corp., four or five have been operating for a number of weeks. Last week four of the six were on.

As is usually the case, a soft spot in automobile assemblies may develop late this month and early in February, pending a full appraisal of the reception of the new models. If Ford swings in on his new line shortly, the steel rate may be moderately well sustained.

For the United States, output of motor vehicles in 1932 approximated 1,375,000 units. Detroit is talking of a 2,000,000-car year in 1933. It believes that the general economic situation of the country will recover beginning in the spring and that automobile sales will reflect this condition, starting a few weeks after the recovery becomes general.

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CHICAGO—Prospects for improvement in the steel markets of the Middle West are clouded by the uncertainty of the largest consumer—the railroads. The railroads could change the Chicago steel picture materially, but there is no assurance they will do so early this year.

It is believed that railroad purchases of track material and equipment are more likely to increase over 1932 than decrease, and various replacements are so much nearer. Nevertheless, the mills cannot count on anything definite.

Farm prices and farm income can hardly recover with sufficient rapidity to supply a substantial lift to the steel industry, but the need for replacements admittedly is large. Some new equipment is being introduced, of which the new small tractor of the International Harvester Co. is a case in point, and the tendency probably will be to increase the steel needs of the industry.

The tonnage of structural material

FIVE-YEAR PLAN, BEFORE AND AFTER: Kuznetskstroy, in Siberia, contrasted in 1928 *and in* 1932, *the latter near the end of the much-heralded industrial expansion program of the Soviet government. At this city is the Kuznetsk metallurgical works, designed and constructed by the Freyn Engineering Co., Chicago. Here are two* 750-*ton and two* 1000-*ton blast furnaces,* 55 *by-product coke ovens,* 15 150-*ton open-hearth steel furnaces and mills for rolling* 1,250,000 *tons of ingots annually into rails, splice bars, tie plates, a full line of structural material, boiler and tank plates, agricultural shapes, wire rods and merchant bars, plus auxiliary equipment. Photo by Soyuzphoto, Moscow, through Carl Haessler, Chicago*

in the Middle West is expected to contract as governments pare their budgets.

The lack of railroad business probably damages the Chicago district more than any other. Shippers' estimates indicate a decrease of 9.2 per cent for cars for holding steel in the first quarter of 1933 from the similar period of 1932, for the country as a whole, while in the Chicago district the decline is estimated at 27.8 per cent.

A year ago, Chicago mills opened with January at 19 per cent, rose to 27.5 per cent in the first week of February and then began to taper off, concluding the first quarter at 24 per cent. This year the industry finds it difficult to get away from 10 per cent.

◆

YOUNGSTOWN, O. — Mahoning and Shenango valley iron and steel interests are confident that 1933 will exceed 1932, although not looking for any marked pickup until the second quarter.

An order for 4000 tons of pipe booked by a valley mill is resulting in slightly higher activity. A bessemer plant has resumed on an accumulation of small pipe orders.

Manufacturers of rolling mill equipment note an expansion in inquiry. Recent strip and sheet releases by automobile manufacturers indicate a good rate of production through January at least.

A number of fabricators of steel have designed new products, including gas station buildings, a new line of steel desks and safes, "steel tile" and grave vaults.

Valley mills opened last January at 32 per cent, went to a high of 36 per cent in the last week of the month and tapered to 19 per cent by the end of the first quarter. So far this year, operations average about 50 per cent of a year ago.

◆

NEW YORK—Despite a slow start, eastern steelmakers look for a moderate upswing in business this quarter. The extremely low rate of 11-12 per cent in operations would make improvement assured, but there are also scattered evidences of an upturn and a gain in sentiment.

Prospects of railroad buying are the best in several months. Heavy track repairs, for spring, are expected to bring out proportionately larger specifications than a year ago. New York Central may inquire for rails within a month. Repeal of the recapture clause of the interstate commerce act might free some buying.

The nearby outlook in building is less encouraging due to reductions in federal and state budgets. Relatively little private work is out in the East. Most active are a 20,000-ton terminal warehouse for the New York Central railroad, a 10,000-ton courthouse and the likelihood that some of the 190,000 tons of steel for the San Francisco bridges will be fabricated in the East.

Philadelphia district steelmakers stand to benefit from seasonal automotive business. Two large body makers are expected to place substantial tonnage momentarily.

The radio industry holds little promise for this quarter, which is also true of the electric refrigerator and shipbuilding industries.

Eastern pipe foundries find specifications well under normal, but freer than in six months.

Some releases are expected this quarter from the textile industry, which bought moderately well in the fall, only to hold up shipments.

Steel Mills Not House Builders

THE steel industry is not prepared and is not contemplating to go into the business of house building, declared V. Gilmore Iden, director of public relations, American Institute of Steel Construction Inc., New York, in addressing the New Jersey Mason Material Dealers association, Jan. 12.

Steel mills roll various structural shapes, many light shapes, which are adapted admirably to the use of the house builder, but, he said, the mills have been rolling these for years and they intend to continue rolling them and selling them to anyone who has the desire to build anything.

Some of the larger mills own and operate fabricating plants and engage in fabricating and erecting structural steel in buildings and bridges, but, continued Mr. Iden, those mill-owned units are operated in competition with some 600 independent fabricating plants throughout the country. These fabricating plants have been equipped to handle heavy work chiefly, and the equipment could not be put to work profitably on the light structural material which would go into house building. Small independent fabricating shops, however, are interested and for many years they or some inventive mind connected with them have experimented with building residences of steel.

"In the better grade of residences we confidently expect to see nothing but steel framing used in the future," he stated, "and as we are able to demonstrate lower costs and better construction the introduction of this method of building will be universal."

In conclusion, Mr. Iden cautioned against exuberant expectations. Steel, he said, is not a material which can be handled successfully by the inexperienced. The occasional beam or column may be stocked by the regular supply yards and erected by any good house builder. But to build a complete frame, to erect an integrated unit, requires the services of persons experienced in steel constuction.

Eaton-Rhodes Reorganized; Fenley Is President

Incorporation papers have been obtained for Eaton, Rhodes & Co., Cincinnati, one of the leading interests in the Cincinnati iron and coke trade, which was established as a partnership in 1907. Greene Fenley Jr., formerly sales manager, is president of the reorganized company, the name to be continued unchanged.

F. R. Rhodes, one of the founders, will retire from active management, but will maintain offices with the company.

The same staff has been retained, and the same sales agency contracts are held, including those with the American Rolling Mill Co. and the Hamilton Coke & Iron Co. as producers of Buckeye pig iron, with the Globe Iron Co., producer of Globe silicon iron, and with various by-product coke ovens.

4-High Mill Patent Valid; License Right Approved

United States district court at Pittsburgh handed down a decision Jan. 9 covering Steckel patent No. 1,779,195 of a four-high roller bearing mill in which the Cold Metal Process Co., Youngstown, O., was plaintiff and the United Engineering & Foundry Co., Pittsburgh, defendant. The court decided that the patent is valid, which is in favor of Cold Metal Process Co., and at the same time decided for United Engineering & Foundry Co. its right to a license under the patent.

The suit was filed in March, 1932, and the main feature in controversy was the use of roller bearings on the necks of the backing rolls, by means of which, according to the patent sued on, heating of the roll necks such as would cause wrinkling or buckling of strips rolled at high speed is avoided.

Johnston Patents Upheld

After litigation extending over eight years, in which the Johnston patents covering electric resistance welding of tubing and pipe, owned

by Steel & Tubes Inc., Cleveland, have been uniformly upheld, the United States Supreme Court has refused to review the favorable outcome in the court of appeals. Steel & Tubes is a subsidiary of Republic Steel Corp., Youngstown, O., where the Johnston process, originally developed to produce small, light wall mechanical tubing, has been applied to commercial production of pipe in sizes up to 16 inches in diameter and in all standard wall thicknesses.

Structural Board Suspends; League Continues Work

Activities of the Structural Steel Board of Trade Inc., New York, have been suspended during the present lull in structural steel demand and Charles L. Eidlitz, chairman, has resigned. The labor policy of the board has been taken over by the Iron League of New York Inc., with Roberts B. Thomas, formerly counsel for the board, retained as counsel for the league. Announcement has been made that the open-shop policy of members will be retained on the same basis.

Officers of the league are: A. J. Post, Post & McCord, erectors, president; George W. Harris, Harris Structural Steel Co., vice president, and Mr. Thomas, secretary and treasurer.

Hughes Made Manager

Frederick G. Hughes, vice president, has been made general manager of the New Departure Mfg. Co., Bristol, Conn., succeeding Dewitt Page, who is ill and recuperating in the South. Mr. Hughes has been assistant general manager of the plant, having joined the New Departure Mfg. Co. in 1911. He was previously connected with Driggs-Seabury Corp., Sharon, Pa., as chief engineer and in other executive capacities. Mr. Hughes is a former president of the American Society for Steel Treating and head of the standardization committee of the Society of Automotive Engineers.

Taylor Returns from Europe

Myron C. Taylor, chairman, United States Steel Corp., returned Jan. 12 from a three-week trip abroad. He reported sentiment abroad better than in the United States, but the foreign steel business no better than the domestic one.

Soviet Finishes Tula Stack

Blast furnace No. 3 at the Tula metallurgical plant was blown in Nov. 27, according to the USSR chamber of commerce. With a daily rating of 400 tons, this the tenth in size in Russia.

New Low Pittsburgh-Detroit Rate, 18.5c, Asked at Hearing

PITTSBURGH—Opening the hearing before the Central Freight, Trunk Line and New England Freight associations here, Jan. 13, on proposed reductions from Pittsburgh and Youngstown, O., to Detroit, Cleveland and Toledo, O., on finished steel products, John A. Coakley amended the original petition.

Mr. Coakley, general traffic manager for eight subsidiaries of the United States Steel Corp., asked for a rate of 18½ cents per 100 pounds from Pittsburgh to Detroit, compared with the present rate of 26½ cents and the original suggestion of a reduction to 20 cents. He stood pat on the recommendation that the rate from Youngstown to Detroit be reduced from 23 cents to 15. These rates include the surcharge.

Cites Heavy Traffic

Mr. Coakley cited that 750,000 tons of steel moved via water into Detroit last year. Steel sales are averaging only $2 to $3 per ton above Pittsburgh base prices for delivery into Detroit, he pointed out, compared with the official rail rate of $5.70 per ton.

The Great Lakes Steel Corp., a subsidiary of the National Steel Corp., with plants at Ecorse, Mich., a suburb of Detroit, was reported in favor of the proposed reduction. So were the Jones & Laughlin Steel Corp., Pittsburgh; Sharon Steel Hoop Co., Sharon, Pa.; and Pittsburgh Steel Co., Pittsburgh.

The Bethlehem Steel Corp. asked for a reduction in the rate from Johnstown, Pa., to Detroit.

The Wickwire Spencer Steel Co., Buffalo, proposed a comparable reduction in the Buffalo-Detroit rate, now 25½ cents.

Cleveland Plants Concur

The Corrigan, McKinney Steel Co. and Otis Steel Co., both of Cleveland, are favorable if the Cleveland-Detroit rate, which is now 22 cents, also is reduced.

The McKinney company proposed a lower rate on finished steel from Monroe, Mich., to Detroit, and on sheet bars from Cleveland to Monroe.

Representatives of the Laclede Steel Co., St. Louis; Inland Steel Co., Chicago; Andrews Steel Co., Newport, Ky.; the American Rolling Mill Co., Middletown, O., and other producers asked for reductions in their rates on automotive steels to Detroit similar to the proposed Pittsburgh-Youngstown-Detroit decrease.

In addition to the adjustment in the Pittsburgh and Youngstown rates to Detroit, steel producers are urging that the rate from Pittsburgh to Cleveland be reduced from 18½ cents to 13 cents, from Pittsburgh to Toledo from 23½ cents to 20 cents, from Youngstown to Cleveland from 12 cents to 8 cents and from Youngstown to Toledo from 20½ cents to 15 cents.

A final decision was reserved, although early action was promised.

Pargny on Leave; Bennett Heads Sheet & Tin Plate

E. W. Pargny, president, American Sheet & Tin Plate Co., Pittsburgh, has been granted a leave of absence until Dec. 31.

C. W. Bennett, vice president, assumes the duties of president, with the title of acting president, during this period.

D. A. Barrett, assistant to the vice president, has been appointed vice president in charge of operations.

Mr. Pargny, who was born in 1866, is now two years past the age for voluntary retirement, with consent of officials of the United States Steel Corp., and is three years short of the compulsory retirement age of 70.

Opens Pittsburgh Branch

Frank Samuel & Co. Inc., Harrison building, Philadelphia, has opened a branch sales office at Tenth street and Duquesne way, Pittsburgh, in charge of McCleane Brown and Gordon C. Grace. The new office will have charge of the sales of alloys, ores, pig iron, muck bar and other products by this company in the Pittsburgh district.

Trade Rails for Oil?

With the return of Prime Minister R. B. Bennett, of Canada, from London, reports are revived in Sydney, N. S., that an effort is being made to exchange Canadian-rolled railroad material for Soviet oil.

Receivers for Pressed Steel

Julius S. Rippel, banker of Newark, N. J., and L. E. Herman, attorney of Jersey City, N. J., were appointed receivers for the Pressed Steel Car Co., Pitsburgh, third largest builder of freight cars, Jan. 11.

Cooper-Bessemer Marks Centenary

COOPER-BESSEMER CORP., of Mt. Vernon, O., one of the oldest builders in the United States of oil and gas engines, celebrates its centenary with the beginning of 1933.

Two brothers, Charles and Elias Cooper, built a small iron foundry at Mt. Vernon in 1833 and thereby laid the foundation for a business now valued at $8,000,000.

The C. & G. Cooper Co. first made castings for plows, carding machines and saw mill machinery. A few years after the cupola fan with its horsepower rig was constructed, the panic of 1837 threatened to wipe out the infant industrial plant, but the brothers hung on, and a little more than a decade later built the first steam locomotive manufactured west of the Alleghenies. It was delivered to the Baltimore & Ohio railroad and was followed by others of the same type.

Issued Scrip During Panic

Recurring panics made periodic threats at the expanding company, but the Coopers issued scrip when money became scarce and the fiat was honored throughout central Ohio.

In the late 50's the Coopers designed and built the corliss engine for distribution in the West and they shared for many decades in the popular reception of that famous old steam plant. With the turn of the century, the Cooper company was widely noted as a builder of high-powered steam engines, and at that time it began to turn to the new natural gas and petroleum industries.

Across the border, in Pennsylvania, the founders of the Bessemer Gas Engine Co. were starting to supply clutches for engines in the oil fields and the two companies grew along similar lines.

Companies Merge in 1929

Both realized the importance of natural gas and its commercial value and both recognized the increasing use of gasoline. The Cooper company in 1908 designed and built a single gas engine of 1000 horsepower—an amazing thing then. It was also instrumental in designing the great compressors used on natural gas pipe lines and contributed largely to the success of extracting more crude from deep wells by supplying batteries of economical power units that operated on raw fuels.

The two companies prospered through the following decades. The Bessemer company was capitalized at $3,000,000 in 1923 and had grown to such a size that it occupied 29 separate buildings. The Cooper company recognized the diesel engine in 1925 and secured manufacturing licenses for the German MAN design. The Cooper and the Bessemer companies had so paralleled their activities in 1929 that the former made a purchase of the latter and the present corporation was organized.

Within the past two years, the pro-rata agreements in the oil industry and the standstill condition of the American shipyards have reduced the corporation's business to 5 per cent of capacity. Yet, the latest report of B. B. Williams, president, shows that the company was flexible enough to enhance its cash position steadily since 1930.

The Business Week In Washington

WASHINGTON — Representatives of the Beaver, Mahoning and Shanango Rivers Improvement association, Youngstown, O., appeared before the rivers and harbors board of the army engineers here Jan. 9, to appeal for another survey of the project.

Army engineers sometime ago reported that canalization of the three rivers in the Youngstown-New Castle district is not economically justified. Originally the project was estimated to cost $112,000,000.

Now it is claimed that for $30,000,000 to $36,000,000 a spur from Youngstown to Struthers could be developed.

Appearing in favor of a re-survey were J. C. Argetsinger, of Youngstown; Representative John G. Cooper, of Youngstown; J. Wallace Dempsey, former chairman of the house rivers and harbors committee; and L. C. Sabin, of the Lake Carriers' association, Cleveland.

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Democratic leaders of the senate have now agreed with leaders of that party in the house that there should be no tax legislation at the present short session of congress. It had been hoped, up to this time, that the budget could be balanced at the present session to prevent a special session, which is now seen as inevitable.

As already pointed out several times in STEEL, President-elect Roosevelt has been much opposed to a special session. Owing, however, to the apparent inability of Democrats in the house and senate to work together, this short session of congress has not been able and will not be able to accomplish many of the things that Governor Roosevelt thinks are necessary. It is now conceeded beyond the shadow of a doubt that a special session will have to be called by the incoming administration.

The house committee on expenditures in the executive departments has filed a majority report opposing the proposed federal department changes suggested by President Hoover, and in accordance with the provisions of the emergency act of the last session congress will take action to prevent the Hoover executive order in this respect going into effect.

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Congressional action looking to the amelioration of conditions adversely affecting American business is urged in representations made by President Harriman of the Chamber of Commerce of the United States to various congressional committees.

One of these proposals calls for the affecting of savings of more than $1,100,000,000 in federal appropriations, to be accomplished partially by the withdrawal of government from activities in which it competes with private business and the reduction of expenditures for veterans' relief by $400,000,000. Another stresses the necessity of tariff adjustment to meet the situation created by the depreciation of foreign currencies.

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William Green, president of the American Federation of Labor, declared at a hearing before the senate judiciary committee that his organization is prepared to compel by strike the adoption of a 5-day week and a 6-hour day.

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The relation of antitrust laws to overproduction of commodities and products will be studied during the coming year by the federal trade commission, according to Col. Charles H. March, now chairman under the rotation system. An investigation of gas and electric utilities will include long distance gas pipe lines.

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Barring of alien laborers on public buildings being constructed within 154 miles of the Canadian border has been approved by the comptroller general.

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Domestic producers requested the full, permissible 50 per cent increase in the duty on cotton ties at a hearing before the tariff commission. The present duty is 1 cent per pound. The commission has taken the case under advisement. Those appearing at the hearing included Thomas Daugherty, tariff counsel of the American Iron and Steel institute, C. F. Stone, president, Atlantic Steel Co., Atlanta, Ga., George Dix, New York, importer, and Representative Malcolm C. Tarver, of Georgia.

MIRRORS OF MOTORDOM

DETROIT

THOSE who have attended an automobile show or have scanned the glamorous magazine advertisements have seen a lot, but they haven't seen all. In fact, so far as competition in the extremely low price field is concerned, they may not have seen anything.

In recent months Detroit has been hearing occasional reports of a small low price car being developed by the Chevrolet organization. The middle of December it appeared that production was getting under way, but some mechanical difficulties are said to have intervened. Now, however, this new line, at one time designated Mercury, is understood to be at the place where it can speedily be put into assembly.

Ford, meanwhile, is maturing his program. Detroit will be badly fooled if, in addition to an enlargement and refinement of the present eight, there is not an extremely low price model, presumably also an eight. There are rumors of a short stroke engine and something unusual in crankshaft bearings. It is known that some experimenting has been done with a roller bearing crankshaft.

So, as Detroit sees it, these principal contenders in the low price field are grooming entries for a real fight. Some believe it may be spring, when the economic skies may have cleared somewhat, before these competitors are at grips. Presumably, each is watching the other closely, ready to checkmate. However, some announcement by Ford appears desirable shortly in order to bolster the spirit of his dealer organization as it sees its competitors pushing their flashing new lines.

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At present, the bantam Austin, of course, is the lowest price car on the market, its base model being $275. Of the standard size cars, the Continental four roadster plumbs bottom at $355, crowded by the Willys four coupe at $395 and the Ford four roadster at $410. In the sixes, the Terraplane roadster is $425 and the light Continental six $450. The lowest price eight is the Ford roadster at $460.

Incidentally, while prices appear unusually low this year and sharp reductions have been made, the "and up" phrase after a base quotation is important. Most base prices are on roadsters, of which the sale is small. As a rule, the 2-door sedans are $50 or so higher than roadsters, and there are many extras. A 4-door sedan with average equipment usually costs $150 to $200 more, delivered, than the base which is used as bait.

Even conceding that at least two important models still are under cover, the prospective auto buyer already has seen more than he can digest. The more painstakingly the new models are examined the clearer it is that previous lines have been outmoded, with the possible exception of last year's Grahams. Any owner of a 1932 or earlier model need only park his car alongside a 1933 job to learn what is meant by obsolescence and to be prepared for the shrinkage in his turn-in value.

Sizing Up the New Models

Not to pass judgment on the new models or inject personal opinion, but to relay the first impressions of competent automotive observers, with the understanding that Detroit is partial to its own:

For two years the Chrysler organization has been acclaimed exceedingly enterprising and a smart merchandiser, but whatever gap there was between Chrysler and General Motors has been closed.

General Motors has done an outstanding job. From Chevrolet to Cadillac the line is diversified. Chevrolet and Pontiac have been received unusually well, for the times. Steel men stand in front of the Olds six and point to the flowing lines of the fenders, hood and radiator grille as the most attractive working in steel they have seen. Steel men also like the Olds treatment of front fenders and valance best.

Dodge is regarded as leading the Chrysler lines, with DeSoto still one of the smartest cars on the road. The snowplow front and closer set wheels of Plymouth belie its size.

The most radically changed car is Willys, and if it goes over the trend toward the European mode will be accentuated in 1934.

Graham is amply justified in claiming to be the most imitated car on the road.

Medium and high price cars again are under the blight of times. The cars that are going over in a big way deliver for less than $1000.

Hudson with its super-six is trying to win back the clientele it lost when it dropped the six for the eight.

The new styles are not entirely an unalloyed joy. The father who is concerned with the future of his son will speculate on the vulnerability of the new overhang of fenders, both front and rear, and the valances, and then set his son up in the automobile hospital business. General Motors will have to educate owners of 1933 models to lower the rear half of their divided windows before trying to close the pivoted front half, to save their glass.

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Automobile cylinders lined with a "mystery metal" discovered near Glendale, Calif, and tested in Detroit and Toledo are said to have shown no wear after 30,000 miles, according to Walter Brown, metallurgist for the Detroit Seamless Steel Tubes Co., Detroit. This "mystery metal" is claimed to have a low melting point, —2000 degrees Fahr.—with 94 per cent iron and 3½ per cent carbon, plus another element the nature of which has not yet been determined, giving it a hardness that defies files

(*Please turn to Page* 34)

Industrial Men in the Day's News

E. J. Hayden, President, International Acetylene Association

FOR 18 consecutive years he has been associated with the Linde Air Products Co., now being manager at Chicago.

THIS period spans the upbuilding of the oxy-acetylene process. The past year he has been vice president of the association.

HE is a native of Brooklyn, N. Y. After ten years with the Linde company in New York he was transferred to Chicago.

E. J. HAYDEN, who was elected president of the International Acetylene association at its recent annual convention as reported in STEEL, Nov. 21, has acquired a broad experience in the industry through his 18 years of identification with the sale and development of oxyacetylene welding and cutting products. He has been associated continuously with the Linde Air Products Co. during that time, which represents practically the entire period of the growth and improvement of the oxyacetylene process. At the present he is located at Chicago as manager of the central division of the company.

Mr. Hayden has spent most of his industrial career in the East. He was born in Brooklyn, N. Y., Jan. 24, 1890, and received his grade school and higher education in that city. His identification with the Linde company dates from 1914, when he joined its sales department at New York. Maintaining his headquarters in that city for ten years, he was made eastern division manager several years prior to 1924, at which time he was transferred to Chicago as manager of the central division of the company.

Mr. Hayden has been active in affairs of the International Acetylene association for some time, having served as vice president of the organization during the past year, election to the presidency being a promotion.

F. J. MARMION, recently manager of sales of Birmingham, Ala., office of the American Steel & Wire Co., has been transferred to Pittsburgh in charge of the office there, succeeding the late E. A. Niven. Mr. Marmion had been manager at Birmingham for the past several years, previously having been assistant manager there.

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M. P. Conway has been appointed Chicago district sales manager for the Concrete Steel Co., succeeding G. O. With, resigned. Mr. Conway formerly was in charge of the Milwaukee office of this company, which has been discontinued.

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Gottfrid Olson, Illinois Malleable Iron Co., Chicago is president of the Chicago Foundrymen's club for the coming year. Other officers include: Vice president, Donald Reese, Whiting Corp.; secretary. A. N. Wallin, S. Obermayer Co. The board of directors also elected includes: R. E. Kennedy, American Foundrymen's association; D. G. Anderson, Western Electric Co.; L. E. Gilmore, Crane Co.; Roy Frazier, Hansell-Elcock Co.; P. Mate, Greenlee Foundry Co.; T. Mauland, International Harvester Co.; E. E. Griest, Chicago Railway Equipment Co.

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H. A. Brainerd, formerly district sales manager at Baltimore for American Bridge Co., Pittsburgh, is now located at Pittsburgh in the company's main offices in the Frick building as assistant general contracting engineer to E. H. Heald, vice president and general contracting engineer.

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Col. A. B. Shepherd, vice president of the Jones & Laughlin Steel Corp., Pittsburgh, is chairman of the committee on rivers and harbors of the Pittsburgh chamber of commerce, which recently presented a resolution disapproving the proposed transferring of inland waterways control from the war department to the department of interior. River shippers in the Pittsburgh district are reported favoring control of the waterways' improvements being left in the hands of army engineers.

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Daniel Hammerschmidt, formerly assistant general purchasing agent of the American Bridge Co., Pittsburgh, has been named general purchasing agent succeeding W. G. A. Millar, who has retired on pension.

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George M. Hunter, formerly manager of operations for the American Bridge Co., Pittsburgh, has been named a vice president of the company. His duties will continue in the operating division of the company.

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Joseph F. Ryan, general works ac-

countant of the Allis-Chalmers Mfg. Co., Milwaukee, has been appointed assistant secretary and treasurer, succeeding the late Donald A. Stewart.

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A. T. Crump is now located at 1112 Fair building, Fort Worth, Tex., as district representative for Reading-Pratt & Cady Co. Inc., Bridgeport, Conn. His former headquarters were in Shreveport, La.

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John M. Mulholand is special representative for railroad sales in the Chicago office of the Youngstown Sheet & Tube Co., which is now manufacturing tie plates at its Indiana Harbor, Ind., works.

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John W. MacMorris, for nine years factory manager for the S K F Industries at Hartford, Conn., on Dec. 15 became factory manager for the Norma-Hoffman Bearings Corp., Stamford, Conn.

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Frederick C. Trubshaw has been elected a vice president of the Vilter Mfg. Co., Milwaukee, a leading manufacturer of refrigerating machinery, engines, etc. He succeeds the late Edward F. Goes. Mr. Trubshaw has been associated with the Vilter company since 1912 as superintendent of erecting engineers. He is the son-in-law of the late Theodore Vilter, founder of the company, who died in 1919.

Obituaries

FRANK LACKNER, 78, who was actively identified with the H. K. Porter Co., Pittsburgh, most of his business career and was general superintendent when he retired, died at Pittsburgh recently. He was born in Pittsburgh in 1854 and was the first apprentice engaged by the H. K. Porter Co. when that firm was organized. Mr. Lackner assisted in the construction of the first locomotive built by the company and in all served in its employ for 60 years, having retired several years ago. He had been vice president and a director of the Allegheny Valley Bank of Pittsburgh since its incorporation in 1900.

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Henry L. Battle, 54, owner of the Battle Machine Works, Dallas, Tex., died Jan. 7.

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Edward H. Kellogg, 40, sales manager of the Mine Safety Appliance Co., Pittsburgh, died at Pittsburgh, Jan. 9.

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Sydney C. Myers, 47, recently identified with the mining machinery and grinding ball industry and one of the best known steel salesmen on the Pacific coast, died recently at Los Angeles. Originally he was associated with his father, George W. Myers, representing the Chrome Steel Works, Chrome, N. J., on the Pacific coast, becoming manager upon the death of his father in 1918 and continuing until the company liquidated in 1928. Since then he has represented Leach Bros., Seattle, and the Philadelphia Iron & Steel Co., Philadelphia.

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Charles E. Fargo, 59, former president of the Fort Dearborn Foundry Co., Chicago, died at his home in Chicago, Jan. 9.

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Roy L. Monge, formerly identified with the Rockford Machine Tool Co., Rockford, Ill., died Jan. 10 in that city.

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Zack E. Cheatham, 47, southern sales manager for the Novo Engine Co., with headquarters in Birmingham, Ala., Dec. 29.

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Richard G. Goosen, 52, superintendent of the Kenosha Boiler & Structural Co., Kenosha, Wis., died Jan. 6.

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Michael J. Flynn, 67, a pioneer resident of Birmingham, Ala., and for 30 years connected with the Sloss-Sheffield Steel & Iron Co., died Dec. 31.

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Cadweller Jones, 61, widely known Alabama industrialist and for a number of years manager of the Union Iron Works, Selma, Ala., died at his home in Birmingham, Ala., Dec. 31.

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Frank C. Kelsey, 70, president, Continental Pipe Mfg. Co. Inc., New York, a native of Louisville, Ky., and widely known as a civil engineer in connection with public works, died at New York recently.

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James A. Coe, 85, president of James A. Coe & Co., manufacturer of iron and steel products, Newark, N. J., died in that city Jan. 5. With Joseph G. Crowell, he established the steel warehouse of Crowell & Coe about 60 years ago at Newark. The name was later changed to James A. Coe & Co.

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Walter McIntosh, 61, general superintendent of machine shops of the Manitowoc Shipbuilding Corp., Manitowoc, Wis., died Jan. 3. He was born at Pasly, Scotland, in 1872, coming to America in 1900 to become identified with the Union Iron Works in San Francisco. Later he served as master mechanic of the Illinois Central railroad, and during the World war he was placed in charge of the shops at the Manitowoc shipyards. After the war he was associated with the American Bridge Co.

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Here and There In Industry

HORACE T. POTTS & CO., Philadelphia, steel warehouse, founded in 1815 by William Lukens Potts, great-great-grandfather of the youngest generation of the Potts name now in the business, was incorporated as of Jan. 1, 1933, as the Horace T. Potts Co.

Over a period of 108 years the company maintained its business in the same neighborhood, near Second and Race streets, and twice built a new warehouse that was the last word in its day. These were built in 1854 and 1898. In 1923 it built its present plant at East Erie avenue and D street. The company is distributor in the Philadelphia district for certain lines for the Bethlehem Steel Co., Union Drawn Steel Co., American Sheet & Tin Plate Co., Page Steel & Wire Co., Blaw-Knox Co., Detroit Seamless Steel Tube Co. and others.

Officers of the new company are: Harrison I. Potts president, Guy P. Bible and Horace M. Potts vice presidents, Thomas C. Potts treasurer, and Morris E. Neeley secretary.

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Electric Steel Foundry Co. and American Cable Co., Seattle, have leased new quarters at 2724 First avenue south, Seattle.

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Rawlplug Co. Inc., 98 Lafayette street, New York, has moved its Cleveland offices and warehouse from 2032 East Twenty-second street to larger quarters at 1315 West Sixth street.

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Birmingham Ornamental Iron Works Co., Birmingham, Ala., has been awarded the contract for ornamental iron fixtures for the $300,000 building program for officers' quarters at Maxwell field, Montgomery, Ala.

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Alloy Metal Wire Co., Moore, Pa., has installed a 14 x 72-inch Cincinnati roll grinder and a No. 1 Cincinnati milling machine. This addition to equipment is to increase output of bright annealed stainless steel in wire rods and strip.

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American Electric Motors Co., Cedarburg, Wis., controlled by the Splitdorf Electrical Co., has gone out of business and the plant has been placed on the market as a unit, according to Joseph Bina, general superintendent. Although the Cedarburg concern was controlled by Splitdorf, its assets were not taken over by Thomas A. Edison Inc. when it absorbed the Splitdorf properties recently.

EDITORIAL

Easing of Debt Burden Will Help To Hasten Recovery

LAST week in the Business Trend section of STEEL it was stated that the debt problem will dominate economic debate in 1933 and that uncertainty arising from unsettled problems of internal debt is the greatest hindrance to business recovery today. On the editorial page of the same issue we urged speedy action on the revision of legislation governing bankruptcy.

The timeliness of these observations was emphasized last Wednesday when the administration at Washington and leaders of both political parties joined in advocating prompt relief for hard pressed debtors. President Hoover's special message on bankruptcy reform was delivered at a time when all factions in congress seemed to be uniting solidly behind a bill designed to ease the adjustment of debts for individuals and small businesses, corporations and the railroads. The resultant movement constitutes what is probably the most direct attack against maladjustments arising from the depression that has yet been attempted by the federal government.

Based on Theory That Compromise With Partial Payment Better Than Default

Sponsorship for the proposed legislation, known as the LaGuardia-McKeown bill, is credited to Solicitor General Thacher, Senator Hastings of Delaware, and the co-authors, Representatives LaGuardia of New York and McKeown of Oklahoma. It is based on the general theory that it is better for everybody for creditors under certain conditions to compromise with debtors and thus receive partial satisfaction of their claims than to insist upon full payment with resultant bankruptcy and practically complete losses.

The mechanics of the plan is substantially that described last week in STEEL'S editorial on bankruptcy reform. A debtor in trouble would petition a court for permission to offer a plan of reorganization. Upon assent of the court the debtor would submit his plan to his stockholders and creditors. If two-thirds of the stockholders and two-thirds of the bondholders and creditors approve the plan, and if the court confirms it, the plan would become operative. The proposal would prevent destructive action by minority creditors.

Relief under the provisions of the LaGuardia-McKeown bill would extend to debtors of all classes. Its application to individuals and small business concerns would go a long way toward relieving the home and farm mortgage situation, which is acute. Its provision for corporations and railroads would facilitate adjustments that are absolutely necessary but which would entail terrific hardships if carried out according to the present regulations.

Is First Step In Dealing With Inequalities Caused by Difference in Dollar Values

While closer study of the detailed ramifications of the plan may disclose discrepancies or weaknesses, the general idea will be welcomed generally as the first real step in national progress toward correction of the injustice of paying debts incurred when dollars were cheap with present hard-earned, dear dollars. Our financial machinery having failed us during this crisis, there are left only the alternatives of deflation to the bitter end, of deliberate inflation through manipulation of currency, or of relief through adjustment of debts.

Advocates of ruthless deflation are few in number; it involves distress beyond the capacity or willingness of the country to endure. Inflation might work if it could be controlled intelligently but the dangers of this method in the United States are recognized and therefore sentiment is against uncontrolled inflation. However the pressure for moderate inflation, or "reflation" is strong. The attitude of the public toward the specific provisions of the proposed debt legislation has not yet been expressed, but it probably will be favorable.

Industry's interest in the La Guardia-McKeown bill lies not so much in the relief to industrial debtors directly as in the possibility that a lowering of the debt burden generally will divert more money into the channels of trade. The railroads, for instance, actually need half a billion dollars worth of improvements in 1933 to restore their properties to fit condition for operation. This expenditure cannot be made until the burden of debt is lowered.

The country at large has accomplished much already in adjusting the debts arising from the more spectacular follies of 1926 to 1929. Much more will have to be done in the same painful way. But if the proposed legislation will ease adjustments for deserving individuals and companies who were not as culpable as some of our money mad "masters of finance," the road to business recovery will be made smoother.

THE BUSINESS TREND

Industry Is Rising Slowly From Year-End Valley

MID-January presents difficulties to those who attempt to size-up the trend of business. The task is made more hazardous this year because of the absence of the customary backlog of railroad business on steel mill order books and of the uncertainty regarding the temper of congress.

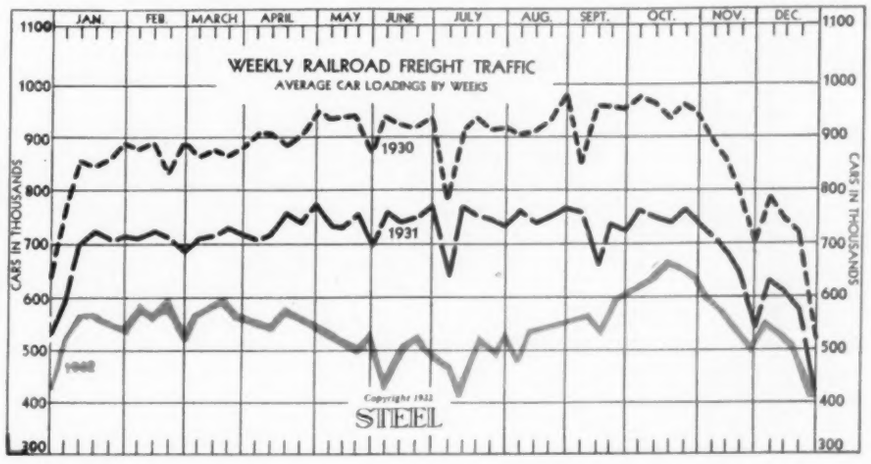
Industry is lifting itself from the year-end trough more slowly than in January last year. However a degree of satisfaction may be gained from the fact that production in December managed to remain slightly above the lows of last summer and further, that thus far in January gains from December are indicated. Therefore it seems likely—barring an unforeseen recession—that the statistics for the first quarter will bear out the opinion that the low point in industrial activity was registered in July or August last year.

Steel ingot output was at the rate of 14.66 per cent of capacity in July and 14.26 per cent in August. In December the rate was 15.02 per cent, a shade over the summer lows. In mid-January it stands slightly over 15 per cent. Thus a further gain of several points in the remaining weeks is necessary to lift the monthly average sufficiently to exceed December's rate of 15.02 per cent.

The operating rate for blast furnaces was 12.5 per cent in December against a low of 12.0 per cent in August. In this case the margin is so slight that the activity of only a few stacks may determine whether or not a second low will be established in January.

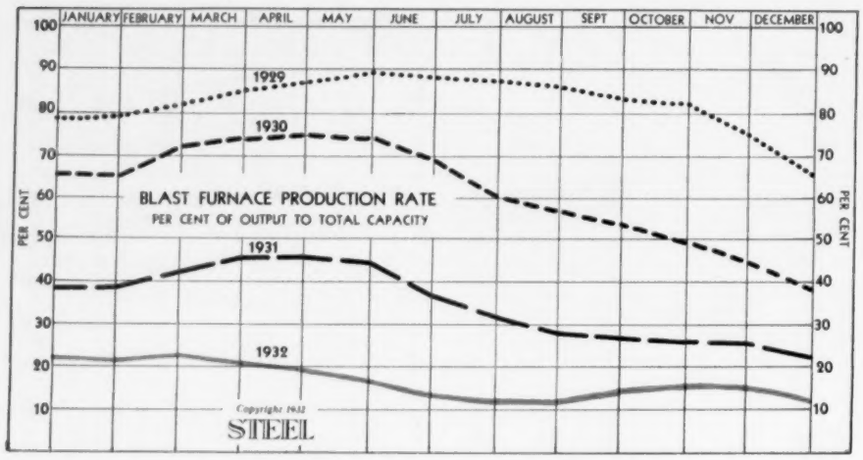
Heavier Freight Traffic Predicted for Great Lakes-Ohio Valley Territory

According to the national forecast of the regional shippers' advisory boards the nation's freight traffic in the first quarter will require 4,002,503 cars as compared with 4,169,316 actually used in the first quarter of 1932, a decline of 4 per cent. Increased loadings of 4.8 per cent in Great Lakes territory and 6.1 per cent in Ohio valley territory are predicted. The commodities for which increased traffic is expected are automobiles, chemicals, lumber, coal and coke, livestock and potatces. An increase of 25 per cent in cars from cement shipments in the Allegheny territory (Pittsburgh district) is forecast.



1932	
Dec.	31..406,779
Dec.	24..494,580
Dec.	17..516,796
Dec.	10..521,216

1931	
Dec.	26..441,589
Dec.	19..581,733
Dec.	12..613,534
Dec.	5..636,366



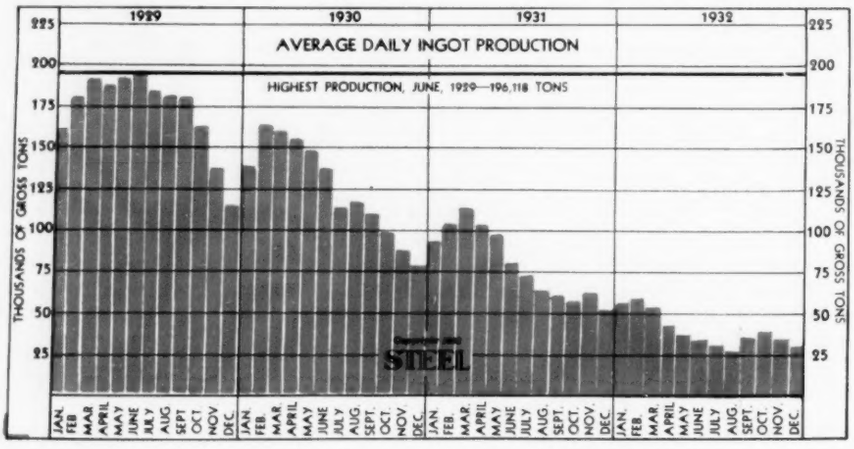
	1932	1931
December	12.5	22.0
November	14.7	25.5
October	14.7	26.3

Blast Furnace Activity Slumps in December

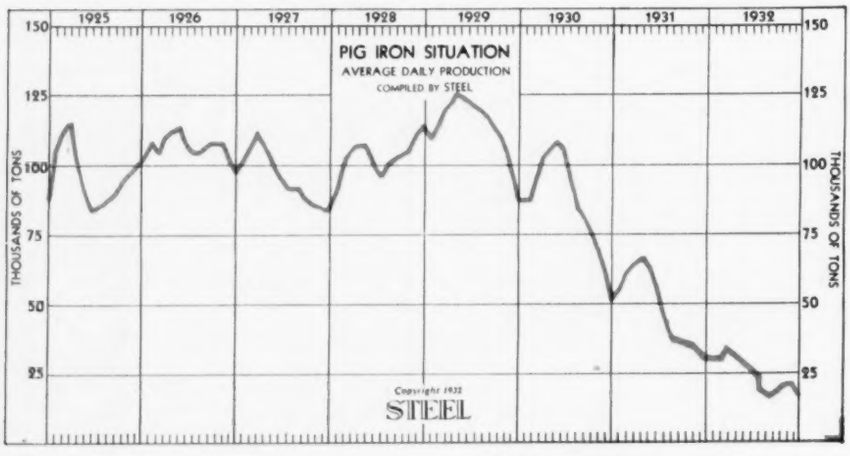
With December's pig iron output slumping almost to midsummer level, nine blast furnaces were dropped from the active list. Relating production to capacity, the operating rate for December stood at 12.5 compared with 14.7 in both November and October. Active furnaces on Dec. 31 totaled 42 compared with 51 at the end of November. The year's highest rate of operation was 23.4 per cent in February, and the lowest, 12.0 per cent in August.

December Ingot Output Holds Above August

The average daily production of steel ingots during December was 32,485 gross tons, which was at the operating rate of 15 per cent. Although this current figure represents a drop of 6546 tons from the previous month, it did not recede to the August level, which was the year's low. Total calculated output for the entire year 1932 was 13,095,727 gross tons, a shade more than half the total for 1931, which was 25,192,715.



	1932	1931
December	32,485	50,047
November	39,031	63,666
October	41,098	58,896



	1932	1931
December	17,650	31,625
November	20,858	36,727
October	20,795	37,831

1932 Pig Iron Output Down; Lowest Since 1896

The daily production of coke pig iron in December dropped over 15 per cent below the previous month for an average of only 17,650 tons. Average daily output for 1932 was 23,699 tons compared with 50,035 tons in 1931, 86,141 tons in 1930, and 115,808 tons in the peak year 1929. With production aggregating only 8,674,067 gross tons in 1932, output in this country has slumped to the lowest figure since 1896, when approximately 8,482,000 tons were produced.

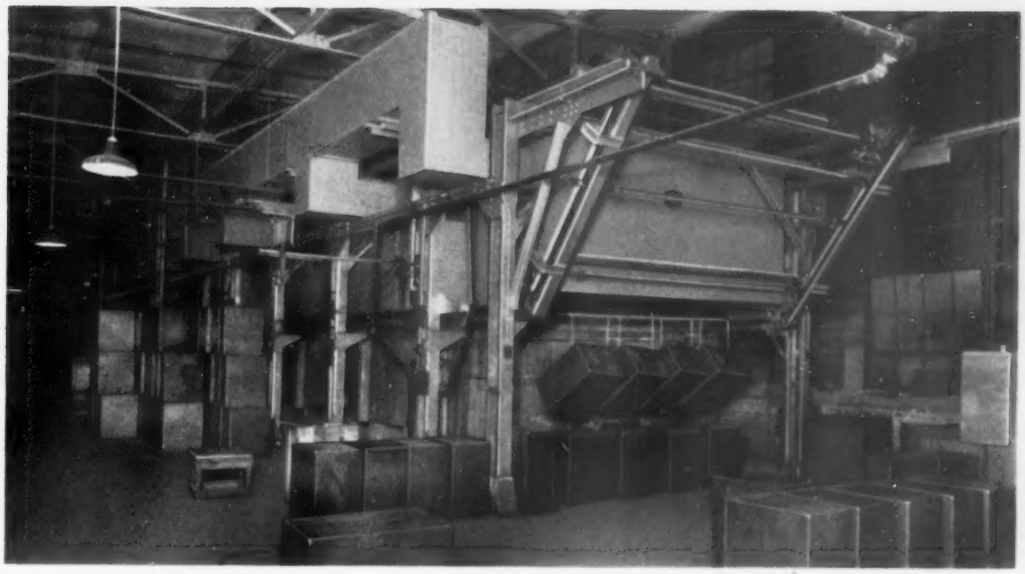


FIG. 1—Loading end of a straight-line type full-automatic pickling conveyor showing four refrigerator liners about to be picked up by transfer for deposit in the first treatment of the cleaning and pickling cycle

PICKLING OF REFRIGERATOR PARTS IS MADE AUTOMATIC BY CONVEYORS

IN LOOKING back a few years in the enamelware field, it is singular to find that pickling room methods in general have not changed appreciably, whereas methods of applying the enamel coat have been improved greatly with advanced designs in continuous ovens, spray equipment and better frits. Several electrical refrigerator manufacturers, however, have modernized their pickling practice with the installation of conveyors and thereby have derived continucus foolproof processes from the initial preparation of the steel to the finished product. Again, it is singular that these refrigerator manufacturers had all operated full automatic conveyors in connection with electrcplating processes and knew by experience the values to be gained in resorting to pickling by automatic means.

An automatic conveyor sometimes is looked upcn as a labor saving device and all advantages other than that regarded as secondary. The argument is raised that pickling operations are simple, require little labor, and with proper solution control, not much is to be gained through automatic methods. Unquestionably, this is true if attention is focused on those days when everything ran true to form, rejects were low and the plant made money. This is not true in less prosperous times when unexpected incidents and the human element

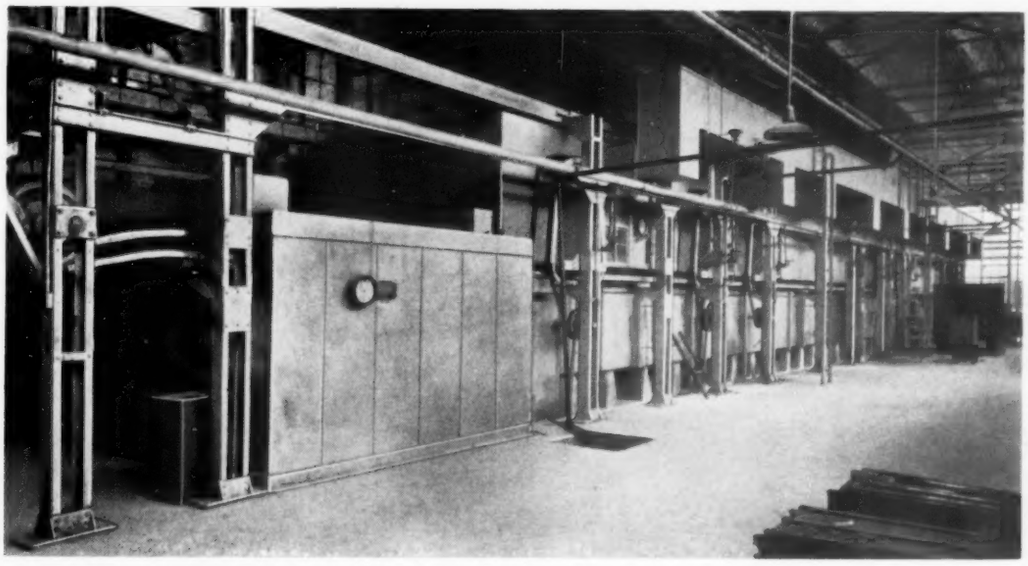


FIG. 2—Side view of a straight-line type full-automatic pickling conveyor in the plant of a large refrigerator manufacturer. The oven in which the liners are hot-air dried after pickling is in the foreground

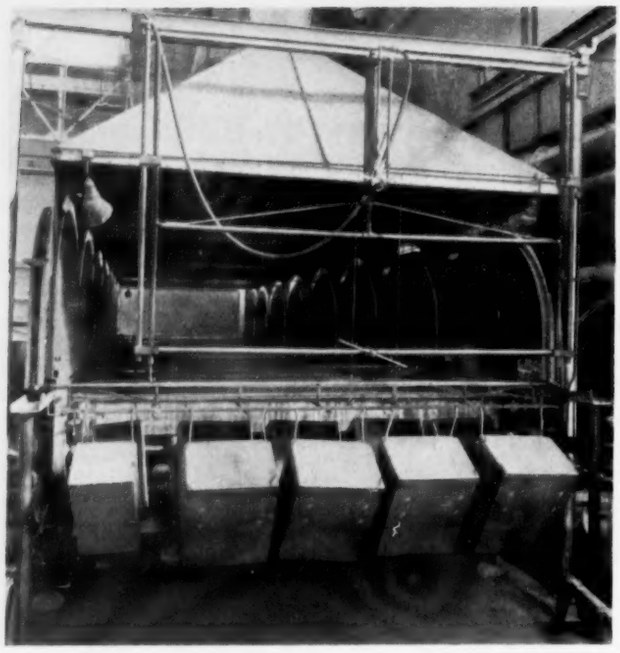


FIG. 3—Unloading end of a dwell-type full-automatic conveyor in the plant of a leading electric refrigerator manufacturer showing five liners on a carrier after having emerged from the final treatment of the cleaning and pickling cycle

start a run of seconds or unsatisfactory work.

Automatic conveyors are not valued in terms of savings in labor so much as their ability to earn money through consistent performance in turning out a high standard of work. If cost analyses were thorough, and losses through interruptions, holdups for adjustments in solutions, refinishing or scrapping work, or separating finished articles into first and second quality ware were computed accurately, probably the profits which have slipped away would make the modest investment of automatic equipment seem small in proportion. Even today, with curtailed production, the unit cost with automatic methods is consistent and can be made to show a real earning capacity.

Back of all of this is a tendency with hand-operated equipment to limit the number of operations to essential treatments to keep down the unit cost. The principal is sound in practice when everything is performing properly, but it does not provide sufficient factor of safety to overcome hazards which crop up continually with the best regulated hand equipment. Neither can the human element be depended upon entirely.

Conveyorized Pickling

Several years ago one refrigerator manufacturer undertook to conveyorize its pickling room. The usual procedure was augmented by additional treatments and adequate rinse waters to insure thorough washing between treatments. This helped to maintain the strength of all baths; solutions were not prevalent and thus assured uniform treatment throughout the mass. Work was suspended upon carriers rather than placed in baskets, and it gave the cleaner and pickle solutions a better opportunity to reach all parts of the articles. There were no localized strong and weak spots through the mass of the bath, such as often are present in hand tanks.

Dryer Prevents Sweating

A dryer was added, capable of producing 400 degrees Fahr. heat if necessary to insure thorough drying of steel in the seams and wherever solution might segregate. This prevented so-called sweating out after the enamel coating had been applied. A quick transfer of a carrier load from one bath to the succeeding bath prevented work from drying in the atmosphere. This was quite important due to the rapid chemical change of the steel when exposed after certain treatments. A simple effective hooding arrangement controlled the fumes and prevented them from attacking the finished work or adjacent equipment.

Seen as "Missing Link"

This first installation was a success. It had a pleasing appearance, was located in the same room and close to the enamel dip tanks and spray booths, no walls or partitions were necessary to separate it from expensive presses close by as the fumes were properly controlled and to its designer it represented the missing link essential to completing the modern methods now employed in enamelware plants. Two conveyors were built for this manufacturer and shortly afterward a somewhat similar unit was installed for another electric refrigerator manufacturer. The latter equipment is illustrated in Figs 1 and 2.

Later another type conveyor was built, having certain radical departures from the customary continuous moving, or straight-line type. This was called the dwell-type conveyor, such as used in the plating industry, but was still lower in cost and had somewhat smaller production capacity. In all there are now six full automatic conveyors used for the treatment of the finished steel product through a cleaning and pickling cycle prior to applying first coat of enamel.

These conveyors were all designed and built by the Hanson-Van Winkle-

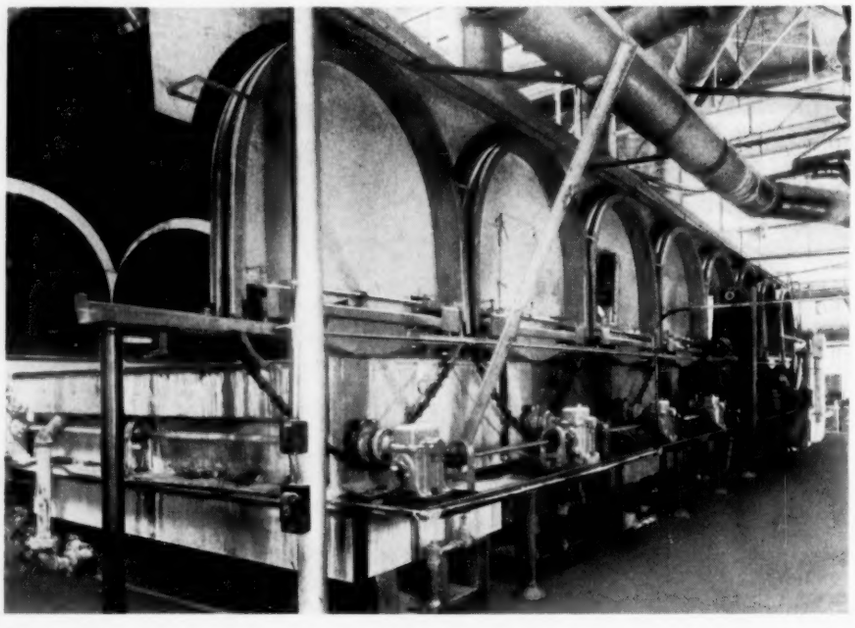


Fig. 4—This illustration shows the details of the transfer mechanism and drive on a dwell-type full-automatic cleaning and pickling conveyor installed in a Midwest refrigerator manufacturer's plant

Munning Co., Matawan, N. J., a company which pioneered in the plating field and has had a wide experience in the treatment of metal articles prior to plating. The first group of automatic plating conveyors was brought out about 15 years ago and today more than 150 of these installations are in operation. The company now is rendering the same type of research and engineering service in the enamelware field.

The dwell-type conveyor, illustrated in Figs. 3 and 4 possibly offers the widest range of applications in the manufacture of enamelware. It is composed of a series of double transfers located at both ends of the intersections of tanks. The work is suspended on hooks from horizontal carrier bars, which engage the transfer chains, move the load quickly out of one bath into the next. The conveyor is timed to dwell the load in each tank a definite period during which time the conveyor is not in motion. A timing device then starts the machine in motion and all bars are carried ahead one treatment.

Intervals May Be Varied

It is possible to vary the intervals so that certain treatments may receive a longer process time than others. While a load is submerged in the solution during the dwell period a forced spray system circulates the solution violently to all parts and crevices, this maintaining the strength of the bath uniform throughout its mass and rendering the same effective treatment to all portions of the work load. This thorough circulating system is appreciated particularly where articles are nested and where the spent acid in localized places does not do effective work. Inversely, it speeds up the time in processing considerably over hand methods and does a much better job.

Variety of Work Handled

One operator at the loading station can hang the work on the hooks, even intricate shapes and bulky work, without difficulty, as the carrier is at rest during this period. The same is true of the unloading station. Work which requires effective drying is conveyed automatically from a neutralizer tank to an inverted-type oven where it remains at rest the time required to permit thorough drying. The carrier bars are designed to take loads as great as 1500 pounds.

This machine lends itself also to other uses, such as bonderizing, deenameling, and simliar operations, where the articles require thorough cleaning and pickling. It is simple in construction with its parts standardized and cost is relatively low.

1933 Model Automobiles Reveal Wider Use of Die Castings for Small Parts

FOCAL points of public attention this month are new models of automobiles, now on exhibition at shows and salons throughout the country. While 1933 designs in general are characterized by the use of more steel, in the form of fender skirts and "beavertails," a correspondingly wider use of die castings for various parts is also noted.

A cursory examination of new models reveals all the well-tried classifications of uses for die castings—hardware, ornaments, carburetors, fuel pumps, speedometer and windshield wiper parts, windshield stanchions and cowl bars, seat regulators, lamp brackets, etc., according to observations by a representative of the New Jersey Zinc Co., New York, who points out that these die cast parts are being adopted more widely by car builders. One case, as an example, is the final adoption this year of a zinc die cast lamp bracket by the LaSalle.

Coincident with the final acception of die castings by some builders, others are taking full advantage of the engineering advances offered by the commercial die casters, improved properties of new zinc alloys and designing with a full flare of complicated coring and thin wall sections, exemplified by the new Buick headlamp bracket, with supporting arms on both sides and below. Both tail lamp supports on the Studebaker are die cast, and the left one on both Studebaker and Pierce Arrow combines the function of tail lamp and gasoline tank inlet. On some cars these lamp brackets are enameled; on others chromium plated.

Thicker Chrome Plate Used

Chromium plating specifications for outside exposure on zinc have received much attention during the past year and those of several manufacturers have been improved considerably. They are now specifying a thickness of coating over zinc die castings comparable to thicknesses they have used over other materials for several years.

The New Jersey Zinc company representative observes that the use of chromium plating appears to be about the same as for the past few years. The Graham is using both front and rear fender spear moldings die cast of zinc and plated. The new Pontiac is also using a chromium plated die casting for a fender decoration.

Several of the new models, including Hupmobile and Buick, this year have adopted die castings for their radiator grille moldings. Side tire carriers clamps, shafts, braces and thumbscrews are now die cast and chromium plated in most instances.

Thin wall sections recently achieved in zinc die castings have added to the list of new applications such items as heater cases and horn projectors. In addition to offering considerable economy die castings are particularly adapted to horn projectors because of the acoustic properties of zinc, a metal which long has been used in organ pipes.

Door Strike Developed

An interesting development in body design is the adjustable die cast door strike, comprising two notched plates which strike on an angle, one plate being adjustable to take up lateral play. Variations of this design are found on many of the new cars.

Die cast structural pieces are numerous: Hudson uses several brackets and corner pieces in the body design; Studebaker has two radiator support brackets; and roadster or sport models of Dodge, Chrysler, DeSoto, Plymouth and Studebaker have die cast cowl bars.

Clutch dust covers and retaining bearings and gear shift housings in several cases are of zinc die castings. The steering column on the Nash is being die cast; while zinc die castings also are being used for the front and rear end plates on the Bendix booster brake.

Olympia Exhibition To Be Held in September

The Twelfth Shipping, Engineering and Machinery exhibition will be held at Olympia, London, Eng., Sept. 7-23, 1933, according to a recent announcement. The first of these exhibitions, which have always attracted engineering interests in the United States, was held in 1906.

This year's exhibition promises to be of a more novel and comprehensive character than ever, the imposition of the tariff having stimulated British invention and manufacture in many fields so that all the latest marine and general engineering products will be displayed.

Applications for exhibit space are being handled by the organizers, F. W. Bridges & Sons Ltd., Grand buildings, Trafalgar Square, London, W. C. 2, England.

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part IV—Mechanics of the Roof

(Fifteenth Article of Series)

VALUES of the weight of the roof designated ½*W* in equation No. 7, may be read directly from Fig. 29. This chart has been prepared as applying to the standardized roofs and is for a roof presented in Table XL. The example shown by the dotted line gives the weight (6850 pounds of one half of a roof ZE which is presumed to have a chord 19 feet 9 inches long. Solved for this roof and chord, and with a 60 degree included angle assumed, the rise being 2.646 feet (found from Table XXXIX, = 1.608 × 19.75/12), HF = 12,800 pounds.

In the denominator of equation (7) a coefficient, K, is included. This represents an increase of the reaction from the effect of thermal stresses developed within the roof, while under heat. These are known to be considerable, but can not be calculated accurately and so empirical factors must be used. One authority* states:

". . . . . in furnace calculations, the cold thrust (of the arch) should be multiplied by a factor of safety, ranging from 2 to 4 for fireclay brick."

Trinks† gives factors dependent on the maximum temperature to which the brick are subjected as follows: to 1600 degrees, 2; to 2000 degrees, 2½; to 2400 degrees, 3; to 2800 degrees, 3½; to 3200 degrees, 4.

The magnitude of K probably increases as the rise of the arch decreases, and lessens as the rise is increased, because as the angle of the reaction is increased, as happens when the rise is increased, the roof is better able to absorb a portion of the strains of expansion within itself by moving upward. If the roof is too flat to compensate with upward movement, horizontal stresses of high magnitude are developed within the brick and these are beyond the capacity of any practical skew or buckstay design to withstand without distortion or failure.

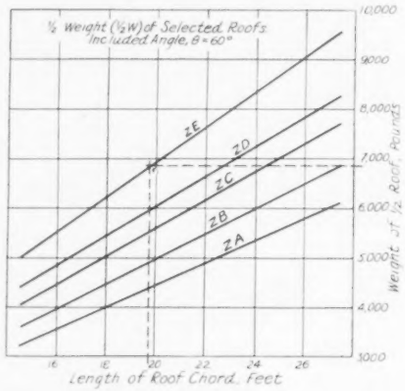


Fig. 29—Chart applying to standardized roofs. Specifications are as in Table XL and weights are based on a 3-foot roof width

These values probably were developed for use with steel construction calculated at the usual structural values. In the design of primary open-hearth furnace components the author uses values which are never in excess of half the ordinary structural rates.

Stress Values Modified

Bearing these comments in mind, K for the thermal stresses is taken as 2.0 throughout this treatise. The correctness and safety of this value is proven by the general use of skewbacks for this service that indicate a factor of less than 2.0 and which have given entire satisfaction under service conditions.

Referring again to equation (7) this develops the horizontal thrust HF which is but one of the two major components of the primary reaction F. It will be necessary to determine the downward vertical component of the reaction DF and this is best found from its relation to F, this latter value being easily determined from the solution of equation (7) for HF.

The angle $\triangle$, of the roof reaction A (or B), Fig. 28, must equal $\frac{\theta}{2}$. In the examples to be considered, $\theta = 60$ degrees. By simple mechanics $HF = \cos \triangle F$, or $DF = \sin \triangle F$. Therefore, with the horizontal force HF determined and the angle of reaction $\triangle$, (30 degrees) known, by transposition

$$F = \frac{HF}{\cos \triangle} \quad \ldots\ldots (8)$$

and

$$DF = F \sin \triangle \quad \ldots\ldots (9)$$

or as the determination of F is unnecessary, DF may be found directly as follows:

$$DF = HF \frac{\sin \triangle}{\cos \triangle} \quad \ldots\ldots (10)$$

By equation (7) HF = 12,800 pounds.

By equation (8) $F = \frac{12{,}800}{0.866} = 14{,}660$ pounds.

By equation (9) DF = 14,660 × 0.500 = 7330 pounds.

These figures, therefore, represent the total static reaction F, from the roof, at either A or B and the division of F into its two components of horizontal and vertically downward stress. As previously explained, the values are for 3 feet of roof and skewback length.

The foregoing is an exposition of a basic principle of arch design necessary of inclusion in the proper design of the open-hearth furnace roof and finds direct application to roof design when the arch chord is horizontal. However almost all open-hearth roofs that probably will be designed or redesigned in the near future at least will require that the arch be designed with a sloping or angled chord. The

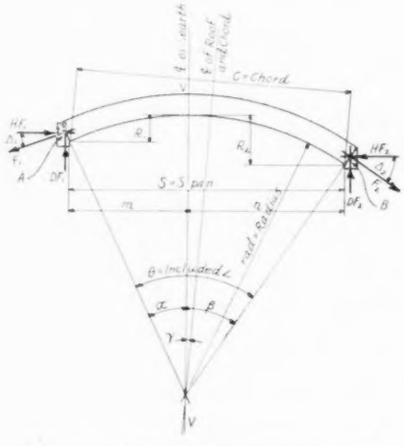


Fig. 30—Factors in inclined roof design

*"Modern Refractory Practice," published by Harbison-Walker Refractories Co., Pittsburgh, page 161.

†"Industrial Furnaces," by W. Trinks, volume 1, page 237.

determination of the forces in such an arch is the same in principle as for the arch with the horizontal chord but the method varies in detail principally in that both sides of the arch must be solved individually and the reactions and stresses at both skews vary considerably in magnitude.

Referring to Fig. 30, which is representative of such an arch, it will be seen that the vertical line V through the highest point of the arch divides the arc and the included angle θ into two unequal segments. The magnitude of the nonsymmetry will be the angle γ and the angles of the two segments α and β and those of the roof reactions Δ_1 and Δ_2 will vary with γ as will also the proportionate lengths of the divided chord, m and n. The roof rise R_1 and R_2 will be different for each segment.

The procedure of calculating the values of a roof with an angled chord should start with the solution of the appropriate roof but considered as though the chord were horizontal. This is accomplished by the method just described and necessitates establishing the length of chord C, the magnitude of the included angle θ, the coefficient k of the roof rise, the angle of inclination γ, and the horizontal reaction HF. Previously 19.75 feet has been used for C, 1.608 for k, 60 degrees for θ, and HF has been determined as 12,800 pounds, based on the ZE roof. It is desirable to continue with the value and if γ is established, say at 4 degrees and 40 minutes, an arbitrary but fair value, all data necessary to the solution of the various factors of Fig. 30 are at hand. The developments of the required data, having reference to both Figs. 28 and 30, are as in equations 11 to 18, inclusive.

In the foregoing it will be noted that the lengths of the span S and the chord C are considered identical. This is entirely correct for the arch with horizontal skews, but erroneous when the chord is angled as in Fig. 30. However, the magnitude of the error is so small (if the chord is angled 4 degrees and 40 minutes the actual length of the chord is, $C = 1.00338S$) that the difference in values reasonably may be ignored.

Another set of factors, which later will enter into consideration of design, includes the distributions of the dead weight loadings of the roof. Previously the weight of 6850 pounds has been found as half the weight of a ZE roof, 3 feet wide with a 19.75 foot span, this being the weight reacting at each end of the roof with skews at the same elevation. If the roof is angled there is a redistribution of this weight, a greater portion being supported at the lower back wall. These distributed weights vary with the angle of inclination γ.

If $\frac{1}{2}W$ represents the weight of one-half a horizontal roof ZE or 6850 pounds, then the weight reacting at the front wall, $\gamma = 4$ degrees and 40 minutes, will be as shown in equation (19); and, at the back wall, as shown in equation (20).

If instead of an arch having an included angle, $\theta = 60$ degrees, as in the forging cases, an arch, $\theta = 72$ degrees, having the same chord (19 feet 9 inches) is assumed, then the reactive and stress values will be as given at the right in Table XLI. The values of the 60-degree roof are included at the left for comparison.

(To be continued)

Table XL

Unit Weights of Selected Ribbed Roofs

Roof	Weight per foot of arc L_2*, pounds
ZA	383
ZB	424
ZC	473
ZD	510
ZE	575

*Three foot of roof length.

Table XLI

Comparison of Reactions and Stresses in ZE Roofs Having 19-Foot 9-Inch Chords

Included Angle:	60 Degrees	72 Degrees
Weight reacting at front, pounds	5,780	6,200
Weight reacting at back, pounds	7,920	8,040
Total weight of roof, pounds	13,700	14,240
Roof rise, R_1, feet	1.91	2.36
Roof rise, R_2, feet	3.53	4.19
Reaction, F_1, pounds	13,640	12,750
Reaction, F_2, pounds	15,560	14,370
Horizontal thrust HF_1 and HF_2, pounds	12,800	10,900
Vertical thrust DF_1, pounds	6,065	6,630
Vertical thrust DF_2, pounds	8,865	9,350
Angle of reaction, Δ_1, degrees—minutes	25—20	31—20
Angle of reaction, Δ_2, degrees—minutes	34—40	40—40

Equations 11 to 20, Inclusive

$\theta = 60$ degrees

$\Delta = \frac{\theta}{2}$ or 30 degrees

$C = 19.75$ feet

$HF = 12{,}800$ pounds

$DF = 7{,}330$ pounds

$\gamma = 4$ degrees and 40 minutes

$$R = C \times k = 19.75 \times 1.608/12 = 2.645 \text{ feet}$$

$$\alpha = \Delta_1 = \frac{\theta}{2} - \gamma = \frac{60}{2} - 4^\circ - 40' = 25.33 \text{ degrees} \quad (11)$$

$$\beta = \Delta_2 = \frac{\theta}{2} + \gamma = \frac{60}{2} + 4^\circ - 40' = 34.66 \text{ degrees} \quad (12)$$

$$m = \frac{C\alpha}{\theta} = \frac{19.75 \times 25.33}{60} = 8.34 \text{ feet} \quad (13)$$

$$n = \frac{C\beta}{\theta} = \frac{19.75 \times 34.66}{60} = 11.41 \text{ feet} \quad (14)$$

$$R_1 = 2m \times \frac{2\alpha}{\theta} \times k = 2 \times 8.34 \times \frac{2 \times 25.33}{60} \times 1.608/12 = 1.91 \text{ feet} \quad (15)$$

$$R_2 = 2n \times \frac{2\beta}{\theta} \times k = 2 \times 11.41 \times \frac{2 \times 34.66}{60} \times 1.608/12 = 3.53 \text{ feet} \quad (16)$$

$$HF = HF_1 = HF_2$$

$$DF_1 = HF_1 \frac{\sin \Delta_1}{\cos \Delta_1} = 12{,}800 \frac{0.4279}{0.9038} = 6065 \text{ pounds} \quad (17)$$

$$DF_2 = HF_2 \frac{\sin \Delta_2}{\cos \Delta_2} = 12{,}800 \frac{0.5688}{0.8225} = 8865 \text{ pounds} \quad (18)$$

$$W_1 = \tfrac{1}{2}W \times \frac{2\alpha}{\theta} = 6850 \times \frac{2 \times 25.33}{60} = 5780 \text{ pounds} \quad (19)$$

$$W_2 = \tfrac{1}{2}W \times \frac{2\beta}{\theta} = 6850 \times \frac{2 \times 34.66}{60} = 7920 \text{ pounds} \quad (20)$$

New Electrolysis Process Gives Pure Rare Metals

A new method of electrolysis for obtaining such rare metals as uranium, thorium and tantalum in the pure state has been developed by Dr. Frank H. Driggs and his associates in the metallurgical research laboratories of the Westinghouse Lamp Co., Bloomfield, N. J. Being continuous and therefore less expensive, this new process is expected to make rare metals available in larger quantities and at lower prices, thereby extending their industrial uses either separately or in the form of alloys.

In the process, a cathode is inserted in a liquid bath containing equal parts of sodium and potassium chloride to which has been added a quantity of potassium thorium fluoride, when the metal thorium is desired. After powdered thorium has collected to a thickness of about one inch on the cathode, it is removed and replaced immediately with another cathode, the feature which makes this process continuous. It is not necessary to destroy the entire bath in order to obtain the metal deposits as in other processes.

Rare metals in the powdered state oxidize so rapidly at room temperature that extreme care must be exercised to prevent the metal from burning up. As the cathode is removed from the liquid bath, the salty solution clinging to it temporarily protects it from oxidation. When the solution is washed away, however, the powder must be preserved in an atmosphere of ether or in a vacuum. After it is pressed into bars, the rare metal does not oxidize at room temperature and henceforth can be handled freely.

Midwest Power Show Date Postponed to June 25

The Sixth Midwest Engineering & Power exposition, originally scheduled to be held sometime during February, now is planned for the week of June 25, at the Coliseum in Chicago. The change has been made to give engineers participating in "engineering week" activity at the Century of Progress exposition an opportunity to visit the exhibits of the large group of manufacturers which will have displays at the power show.

Early indications point to a complete utilization of the 85,000 square feet of floor space available at the Coliseum, according to the show management. Exhibits will include machinery, equipment and supplies, typifying latest advances in the various wide uses of power—from ordinary power operated tools to large generators, engines, pumps, heating and air conditioning units, and others.

Educational features of the power exposition will be sponsored by Armour Institute of Technology, Chicago, with George F. Gebhardt, professor of mechanical engineering, in direct charge. G. E. Pfisterer, 308 West Washington street, Chicago is director of the show.

GAS LINE BURSTS; WELDS HOLD: Effects of cold weather contraction added to an operating gas pressure of 250 pounds resulted in this failure in a 26-inch welded pipe line which has been in service over a year, extending over 149 miles of the distance between Kettleman Hills and Long Beach, Calif. Size of the hole in the ground is an indication of the tremendous force with which the gas was released. None of the adjacent welds, however, showed any signs of fracture, the weld nearest the break being at the point where the men are standing on the pipe. This section of the line was welded by H. C. Price Inc., Bartlesville, Okla., using the shielded arc process with electrodes and gasoline driven welders supplied by the Lincoln Electric Co., Cleveland

Testing Society Issues 1932 Standards

American Society for Testing Materials has issued its 1932 Index to A. S. T. M. standards and tentative standards. This index, issued yearly and in this case complete as of October, 1932, is designed to be of service both to those familiar with the society's standards and those who are not.

Its value to the former group is in locating any specification or method of test in the bound society publication in which it appears and to both groups the index is a convenient reference in ascertaining whether any specifications, methods of testing, recommended practices or definitions have been issued on a specific subject in the field of engineering materials and the allied testing field.

The 441 standards and 226 tentative standards in effect as of October, 1932, are indexed under appropriate key words according to the materials or subjects to which they apply. Copies of the index may be obtained without charge by addressing the headquarters of the socity at 1315 Spruce street, Philadelphia.

Exhibitors Group Selects New Officers for 1933

The Exhibitors Committee Industrial and Power Shows Inc., 330 West Forty-second street, New York, has elected L. W. Shugg, General Electric Co., Schenectady, N. Y., as its president for 1933.

Other officers chosen at the recent meeting of the board of directors are as follows: Vice president, C. F. Radley, Oakite Products Inc., New York; secretary, H. N. Shackleford, Johns-Manville Corp., New York; treasurer, J. P. Ferguson, Reading-Pratt & Cady Inc., Bridgeport, Conn.; and assistant secretary, W. A. Hemming, Exhibitors Committee, New York.

The committee, a nonprofit organization, has just completed its sixth year of work in furnishing a large number of manufacturers who exhibit with worthwhile information concerning all of the larger industrial and trade shows scheduled each year. This information, issued in the form of status reports on each show, is made available to the membership and is said to have been helpful in assisting manufacturers in their exhibition work.

Railroad Program Target For Harbors Congress

Heading the program of the twenty-eighth convention of the National Rivers and Harbors Congress, to be held in Washington, Jan. 17 and 18, is a consideration of the program of legislation formulated by the Association of Railway Executives. Officials of the congress are apprehensive that if the railroads succeed with their program they will obtain a monopoly of all methods of transportation and destroy inland waterways. Officials of the congress see a menace in the effort of the railroads to combat truck and waterway competition as a means of climbing out of the depression.

Making the Most of

METHODS AND MATERIALS

THE oxyacetylene cutting torch undoubtedly is the major and most important tool employed in railroad car and locomotive scrapping. Without it, the operations could not be carried out on the present profitable basis, as the cost of scrapping by entirely mechanical methods would be prohibitive in most cases. One scrapping program for 2000 cars produced 29,729 tons of salable scrap, 1888 tons of recovered material in usuable condition, or approximately 6 per cent by weight, and in addition 400,000 feet of re-usable lumber. Where the work is done efficiently, the gas consumptions for car scrapping will average approximately as follows: Flat cars, oxygen 770 cubic feet and acetylene 190 cubic feet; wooden box cars, oxygen 300 cubic feet and acetylene 70 cubic feet; and all-steel gondolas oxygen 1150 cubic feet and acetylene 290 cubic feet. While all-steel cars require the most gas, the amount of classified scrap obtained from them is increased in proportion.

\$ \$ \$

It is a known fact that Dow metal, a magnesium alloy, can be electric spot welded, but often it is thought impossible to obtain consistently good results. Application of thyratron control, however, is thought by welding experts to be an important factor in solving this problem.

\$ \$ \$

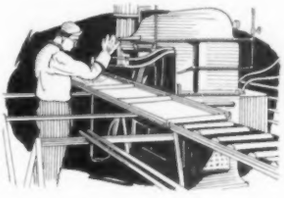
BLISTERING trouble accompanied with a black speck condition in the cover coat enamel was observed in a stove plant, but the difficulty occurred only with one type of casting. Other castings made from the same run of iron apparently were free from trouble. The foundry superintendent denied that he had changed any of his practices and stated further that no facings were used on any of the molds for castings which were to be porcelain enameled. On checking back in the foundry and watching the molders as they worked, it was found that the molder on this particular part was using his own individual bag of facing which he used artfully and kept carefully concealed. Several instances of this kind in different plants have been experienced.

\$ \$ \$

Chromium-plated cast-iron kitchen utensils recently have been introduced by a large manufacturer. It is pointed out that the chromium finish makes the product ready for instant use, eliminates the necessity for seasoning, prevents discoloration and makes the utensil easy to clean.

\$ \$ \$

Electric spot welding of 18-8 chrome-nickel corrosion-resisting steel is being accomplished with thyratron control in both production and experimental shops without discoloration on the surface of the pieces being welded. One shop is making good welds on high-tensile strength stainless steels



in various thicknesses from 30 mils down to 10 mils without the slightest trace of discoloration. In testing these welds to destruction it is found always that a hole is pulled in one piece or the other. Another test is twisting the weld through an angle until failure occurs and this angle always exceeds 90 degrees.

\$ \$ \$

A Detroit automobile builder employs a relatively simple method for cleaning scale from front axles. Before the axles are loaded into the continuous hardening furnace they are immersed in a tank of chloride solution for a few minutes. This has little immediate effect upon the oxide resulting from forging and normalizing, but after the pieces come out of the hardening and drawing furnace, the scale shells off clean and completely by merely dropping the axle on the floor. This practice would be impossible if the furnace contained the ordinary heat-resistant alloys, because they are affected by the chloride. However, the furnace is of the walking-beam type in which the beams periodically emerge through narrow slots in the floor and move the axles ahead a few inches and immediately retire to the cooler channels below. Common carbon steel consequently can be used for these furnace parts.

\$ \$ \$

ELECTRIC air heating is proving economical in places where other sources of heat are not readily and cheaply available. It is especially well adapted to heating small isolated watchmen's stations, crane cabs, etc. According to a large manufacturer of heating units for these purposes, the energy required to heat the air in a room is calculated as follows; Watts $= (0.5nc + 30g + 7s)\ 0.01t$; in which n is the number of times the air is to be changed, c is the volume of air in cubic feet, g is the area of window glass in square feet, s is the area of exposed walls in square feet, and t is the difference in temperature in degrees Fahr.

\$ \$ \$

A large heavy crankshaft for a 4-cylinder diesel engine recently broke through squarely, thus shutting down the engine at a critical time. Two oxyacetylene welders working for exactly 2½ hours repaired the shaft ready for machining.

\$ \$ \$

A cast iron of the following analysis has been found to give excellent results when applied to aluminum melting pots: Total carbon, 3.00 to 3.30; silicon, 1.00 to 1.20; nickel, 1.50 to 2.00; and chromium, 0.70 to 0.80 per cent. This material is thermally stable and shows a fair degree of growth-resistance at temperatures up to 1200 degrees Fahr. Melting pots produced from such a composition are said to have shown four to six times the life of ordinary cast-iron pots. The cupola mixture usually employed is as follows: Steel scrap, 40 per cent minimum; pig iron, 30 per cent maximum; and cast iron scrap, the balance.

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Effect of Cutting Conditions

By T. G. Digges, a paper presented at the annual meeting of the American Society of Mechanical Engineers in New York Dec. 5-9, preprinted, 12 pp., 22 ills., 2 tables.

A quantitative study was made of the work hardening near the machined surface of steel forgings resulting from cutting with lathe tools. This study was based on hardness surveys. Comparisons were made of the work hardening resulting from changes in size, form, and composition and heat treatment of the steels cut. Observations were also made of the influence of cutting conditions on aging, corrosion resistance, chip hardness, structure near the machined surface of some of the steels cut, and of the effect of anneaing temperatures (100 to 720 degrees Cent.) on the surface hardness of some of the steels work hardened in the lathe tests. All lathe tests were made without cutting liquids and with sharp high-speed steel or cemented tantalum carbide tools.

—STEEL, 1-16-33

Zinc Alloys for Die Casting

By J. B. Nealey, in Metal Progress, December 1932, p. 43, 4 pp., 1 ill., 2 tables, 1 chart.

Developments sponsored by the New Jersey Zinc Co., following intensive work in its research laboratory, are outlined. New zinc die-casting alloys and developments in the art of die design have greatly improved the product by insuring a denser structure. The "unit die" system is described and examples of unusual die life are cited. Improved zinc alloys, containing small percentages of copper, aluminum and manganese, show elongation in 2 inches of from 4 to 10 per cent and impact values of 15 to 20 foot-pounds for ¼-inch square bars. Effects of aging treatments on tensile and impact strength of these alloys are charted.

—STEEL, 1-16-33

Residual Metals in Steel

By Clyde E. Williams and John D. Sullivan, in Metals and Alloys, November 1932, p. 240, 4 pp., 4 ills., 2 charts, 6 tables.

Discussion of the amounts of residual metals present in open-hearth steel, as now made commercially; the rate at which these metals are increasing due to the increasing amounts of alloy and coated steel being made and returned as scrap; and the effect of these residual metals on the manufacture and use of the finished steel. Nickel, copper tin, manganese, chromium, arsenic, lead, molybdenum, vanadium and zinc are some of the residual metals present in varying amounts in the steels investigated.

—STEEL, 1-16-33

Roller Bearing Accuracy

Abrasive Industry, January 1933, p. 8, 3½ pp., 5 ills.

Rapid production of both large and small sizes of antifriction bearings to close tolerances, and the part precision grinding methods play in accomplishing this end.

—STEEL, 1-16-33

Rivet-Bolts vs. Rivets

Reports No. 2304 and 2310, issued by testing laboratories of the department of civil engineering, Columbia university, New York, for the Dardelet Threadlock Corp., New York, 32 pp.

The first report deals with comparative load-displacement tension tests on lap joints assembled with Dardelet rivet-bolts and hot-driven rivets; the second with comparative load-displacement tests on butt and lap joints assembled with the rivet-bolts and hot-driven rivets.

—STEEL, 1-16-33

Variables in Arc Welding

By F. R. Hensel and E. I. Larsen, in Metals and Alloys, November 1932, p. 250, 5 pp., 14 ills., 8 tables.

Data concerning the effect of welding conditions upon the nature of the deposited metal, results of the McQuaid-Ehn test on different types of fusion welds and the effect of temperature on the impact strength of weld metal. Variables considered are: Arc length; shielding; alternating and direct-current welding; electrode coatings; and atmosphere in the vicinity of the iron arc.

—STEEL, 1-16-33

Diamond Core Drill Fittings

Commercial standard CS17-32, second edition published by bureau of standards, Nov. 15, 1932, available from government printing office for 5 cents.

Listing of nomenclature, symbols, dimensions, tolerances and types recommended as standard for diamond core drill fittings; complete with diagrams and tables. Effective date for new production and clearance of existing stocks was Aug. 15, 1932.

—STEEL, 1-16-33

Alumina and Silica in Steel

By J. G. Thompson and J. S. Acken, bureau of standards research paper No. 496, available from government printing office for 5 cents.

The hydrochloric acid residue method, as used at the bureau of standards for the determination of alumina and silica in steels, is described. Results obtained by this method compare favorably with those obtained by the bromine and nitric acid residue methods.

—STEEL, 1-16-33

Design from Production Angle

By Harold F. Shepherd, in Machine Design, December 1932, p. 15, 4 pp., 5 ills.

First of a series planned to remind designers of methods to reduce costs and produce better designs by more careful consideration of manufacturing facilities and their application. Part I deals with foundry problems.

—STEEL, 1-16-33

Efficiency and Appearance

By Walter Dorwin Teague, consultant designer, in Machine Design, December 1932, p. 22, 4½ pp., 6 ills.

Pointing out with practical examples how improving appearance of a product may stimulate sales, and how a poor appearance may retard sales. A broad field is open for the industrial designer skilled in producing striking effects with modern materials.

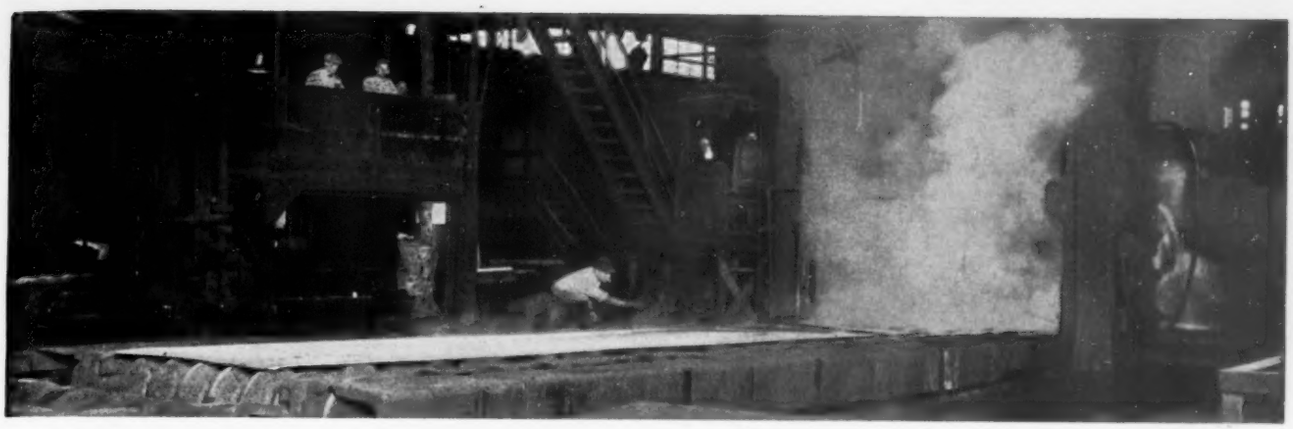
—STEEL, 1-16-33

Electric Melting Furnace

By Ralph R. West, in The Foundry, December 1932, p. 18, 3 pp., 2 ills., 1 table.

Describing changes made in the redesign of a 3000-pound per hour electric melting furnace to reduce electrical charge and to permit pouring metal five days a week. Transformers were altered; voltage for operating on open circuit was lowered; smaller electrode clamps and carbon coolers were used; and the furnace was relined to a diameter of 40 inches.

—STEEL, 1-16-33

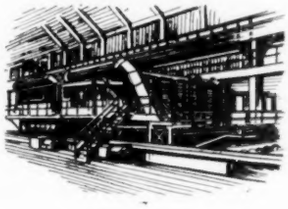


PROGRESS IN STEELMAKING

EQUIPPING quench tanks with individual motor-driven pumps for the circulation of the quenching fluid has effected an economy in the operating and maintenance costs of a heat treating department at a plant in the East. The tanks can be moved to different locations when desired, thus minimizing the required quenching equipment. In event of contamination of the quenching fluid, renewal need be made only in one tank instead of several as when a central system is used.

♦ ♦ ♦

Removing heavy dirt, grease and scale from the housings of a mill in the Pittsburgh district is accomplished by the use of a high-pressure spray cleaning system at a cost of $1.50 compared with a cost of $16 under the previous method.



MEASURING temperature of heating furnaces up to 5500 degrees Fahr. is possible by the development of an optical pyrometer in conjunction with a 3-range telescope. The indicator has a direct reading scale with ranges of 1100 to 2600 degrees Fahr. and 2200 to 3700 degrees Fahr. A conversion table is used for the third range. The lamp current is controlled by a rheostat housed in the telescope thus making it easy to keep the telescope pointed at the object.

♦ ♦ ♦

Molybdenum high-speed steel with a tungsten content of approximately 25 per cent of the total amount of molybdenum present and with other alloying elements the same as found in commercial grades of high-speed steel and in the usual percentages, is of recent development. The tungsten addition improves the microstructure and strength, increases the cutting quality to a marked extent and renders the plasticity more uniform. Drilling tests disclose the cutting quality of this grade approaches that of the 18-4-1 type tungsten steels.

WASHING all molds in a tank of water before dipping in tar to preclude the contamination of dirt with the coating, removes one of the causes of corner cracks on the ingot, according to a steelmaker in the Pittsburgh district. At his particular plant where standard molds are used for killed-steel ingots of 11,300 pounds, the wash tank is built with a false bottom and is emptied daily.

♦ ♦ ♦

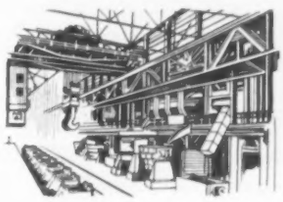
Tubing with a wall thickness of one-eighth of the outside diameter has been welded successfully with the seam free from recurrent weld and inclusions by a recently developed electric tube welder. A series of flat-faced contactors are mounted on circular carriers and successively contact with the tube on each side of the seam cleft as the tube passes through the machine. The contactors carry the welding current without overheating, sparking and deformation of the tube wall. Contact is made and broken at predetermined points simultaneously. With the newly developed process, it is claimed that the production of welded mechanical tubing is extended both as to wall thickness and materials. The tubing can be hot or cold worked readily in a manner similar to seamless tubing.

♦ ♦ ♦

Introduction of a new device now permits piles of sheets to be handled entirely by the crane operator and six hand-operated carriers to be eliminated. The unit, adapted to any traveling overhead crane, picks up a load and spots it at any angle despite close clearance between piles.

♦ ♦ ♦

Hot roll neck lubricating, power and bearing costs are greatly reduced by the use of a newly devised sodium base grease containing tallow, high fire test cylinder oil and flake graphite. The compound is made in various plasticities for application with mechanical lubricating systems.



RECENT experiments made with a mixture of blast furnace and coke oven gas in open-hearth practice discloses that by preheating the mixed gases to a temperature of about 2200 degrees Fahr., the hydrocarbons are dissociated and sufficient particles of carbon produced in the form of soot to give a luminous flame.

♦ ♦ ♦

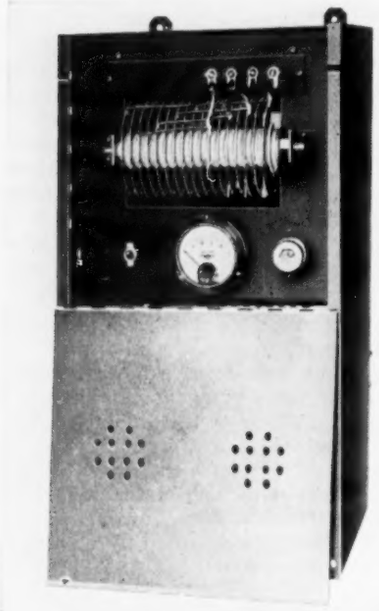
Unburned magnesite brick will absorb and expel about 40 per cent more heat than fireclay brick, according to tests made recently at an eastern plant, thus making this type brick highly suitable for open-hearth regenerative checkers.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Units Convert Alternating To Direct Current

Square D Co., Detroit, recently announced that it has increased its line of RectiFilters by adding new units employing copper oxide and tube type rectifiers. They convert alternating current to direct current merely by connecting the input to any regular alternating current source of supply. Units delivering output with a degree of alternating current component down to 0.0002 volts are available. Such requirements as telephone switchboards, signal and clock systems, fire and police signal systems, sound-on-film and broadcasting can be supplied by the new units.



Square D RectiFilter equipped with copper oxide dryplate rectifier

The accompanying illustration shows one of the new units equipped with a copper oxide dryplate rectifier.

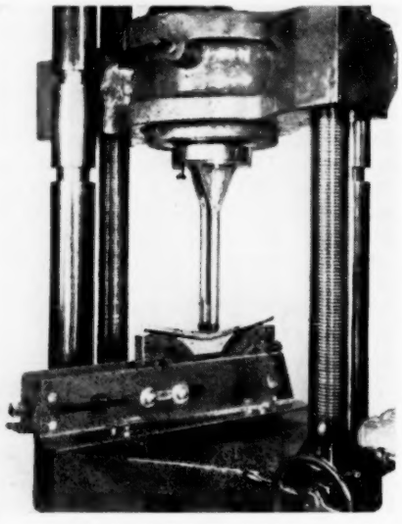
◆

Introduces New Cold Bend Testing Device

Baldwin-Southwark Corp., Philadelphia, recently placed on the market a cold bend testing device developed by Prof. C. H. Scholer of Kansas State college. As shown in the illustration at the right, the device is adaptable to any type of testing machine having facilities for compression testing. It consists of two cast iron segmental rollers of 6-inch radius mounted on hardened steel pins 2 inches in diameter. These are mounted in a frame of standard steel angles.

Load is applied by a column consisting of two 1¼-inch diameter steel rods welded to a base plate which is fitted with clamps for attachment to the spherical head of the testing device. The other end of the rods are welded together with a fillet ¼-inch wide and the ends milled with a V-shaped groove to hold the hardened steel pins around which the bar is to be bent.

To bend a bar through 180 degrees requires a movement of 6 inches plus the diameter of the bar plus the radius of the pin. Bending always will start with a span of 12 inches plus the diameter of the pin plus twice the thickness of the bar. It is this long span which causes the bar to bend with relatively low loads.

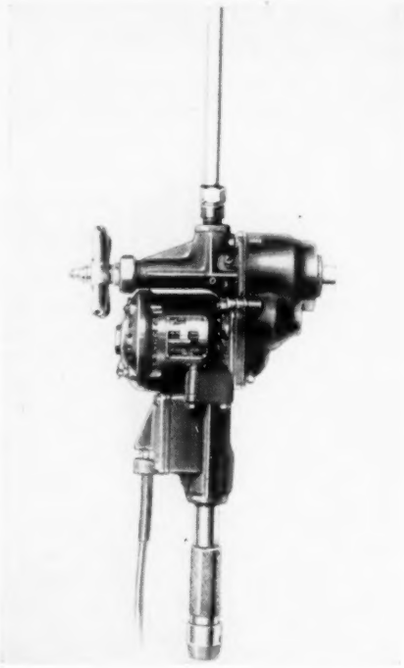


Cold bend testing device marketed by Baldwin-Southwark Corp.

◆

Balanced Drill and Reamer Compact in Design

Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, has designed a new type of drill and reamer as can be seen in the illustration at the right. The offset motor is separate from the frame and feed screw post, which makes a short, rugged machine and permits the use of a feed of greater range. This design also permits the use of a short spindle, necessary when operating in close places.



Drill and reamer developed by Independent Pneumatic Tool Co.

Another feature of the machine is the switch handle of the safety roll type. This switch cannot be operated except by a turn of the operator's hand, and automatically closes when the hand is removed from the grip. The new switch handle is similar in appearance to the throttle used on pneumatic drills. It has no exposed slots and openings, and there is no possibility of dust or dirt entering through the handle.

◆

Develops Special Electric Bench Grinder

Black & Decker Mfg. Co., Towson, Md., announces a new 6-inch special electric bench grinder. Balanced rotating parts of this new unit keep down vibration, while rubber feet make it exceedingly quiet. It is easily portable, and is furnished with two grinding wheels, one coarse and one fine, with ½-inch faces. In addition there are two adjustable tool rests and two adjustable wheel guards, the latter making it possible to grind at any position on the circumference of the wheel.

Freed of Holiday Blight, Steel Activity Gains

Operating Rate at 17 Is Best Since November—Tin Plate Mills Average 50 —Three Blast Furnaces Resume—Scrap Slightly Stronger—Shape Awards Low

STEEL production jumped 1½ points to 17 per cent in the week ended Jan. 14, the highest rate since the last week of November and two full points above the average for December.

Much of this improvement, which exceeded the expectation of the industry, followed the complete passing of the holiday and year-end influence. Many consumers who closed before Christmas resumed last week, and ordered. Others, inventory-taking ended, again were free to take in steel.

Continued substantial releases from the automotive industry were a factor, and while the sheet and strip mills which are the chief beneficiary of this business are operating on day-to-day schedules, there is reasonable assurance of good volume through the remainder of January.

No small support was contributed by tin plate mills, which last week expanded their operations 5 points, as in each of the two preceding weeks, going to an average of 50 per cent for the entire industry. Some independent tin mills were engaged more than 60 per cent.

Not all districts and products participated in this forward movement and a spotty situation obtains, but even where the drag was heaviest the average of early December, in point of demand, was regained. The decline of only 161 tons in the Steel corporation's unfilled orders Dec. 31 is evidence of the turn.

Only the Buffalo district lost operating ground last week, and this was due to its being the off week in a staggered schedule. Cleveland held at 35 per cent and Chicago at 10. Other districts lifted slightly, Philadelphia to 11½, Pittsburgh to 14, Birmingham to 20 and Youngstown to 18. To equal the 26 per cent average of last January is too much to hope, but if the last half of the month is relatively as good as the first, 20 per cent is possible.

The chief handicap at present is the lack of railroad track materials. No outstanding rail orders are in sight, though fastenings are in better demand. Chesapeake & Ohio is inquiring for 1050 tons of screw spikes; Atlantic Coast Line has placed 5000 kegs of spikes; Seaboard Air Line has distributed some tie plates. New York Central has ordered 5000 wheels. Final statistics for 1932 place domestic freight car orders at 1739, against 10,694 in 1931, 45,146 in 1930 and 106,105 in 1929.

Structural awards, at the low total of 6283 tons for the week, reflect the tightening of federal and state budgets. Republic Steel Corp. has booked 4000 tons of steel pipe for Los Angeles. Bids are in at Washington on 1400 tons of cast iron pipe. River barge and pontoon work is moderately good, American Bridge Co. booking 1500 tons. Jobber specifications for wire are noticeably better at Chicago. Auto needs hold sheet mill activity relatively good.

Pig iron shipments continue to gain slowly, and thus far in January two merchant and one steelworks blast furnace stacks have resumed. In addition to several hundred tons in December, the Japanese have delivered 500 tons of pig iron at Philadelphia.

At Pittsburgh, Youngstown, New York and Boston scrap prices are slightly higher, for the first time since October. The movement is not substantial and it leaves the scrap composite of STEEL unchanged at $6.21, but if continued a few days it may be significant. Japan is taking 30,000 tons of steel scrap from Baltimore, this being 90 per cent of the salvaged material from scrapping 127 shipping board vessels.

Barring weakness in sheets, which is affecting all districts, finished steel prices are holding. Pig iron also is firm. The adjustment in foreign iron ore is completed with a reduction in chrome ore. STEEL'S composite of iron and steel is unchanged this week at $28.83 and the finished steel composite at $46.50.

Composite Market Averages

	Jan. 14	Jan. 7	One Month Ago Dec., 1932	Three Months Ago Oct., 1932	One Year Ago Jan., 1932	Ten Years Ago Jan., 1923
Iron and Steel Composite	$28.83	$28.83	$28.93	$29.32	$29.98	$41.17
Finished Steel Composite	46.50	46.50	46.74	47.64	47.28	59.01
Steelworks Scrap Composite	6.21	6.21	6.41	6.96	8.03	20.39

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Jan. 14, 1932	Dec. 1932	Oct. 1932	Jan. 1932
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	17.26
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.60	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	17.26
No. 2 foundry, Chicago	15.50	15.50	15.50	16.50
*Southern No. 2, Birmingham	11.00	11.00	11.00	12.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.76	14.16	15.76
Malleable, valley	14.50	14.50	14.50	16.00
Malleable, Chicago	15.50	15.50	15.50	16.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	22.29
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.63
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	79.85

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	2.00	2.25
Connellsville, foundry, ovens	2.50	2.50	2.75	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	27.50
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.50
Wire rods, Pittsburgh	37.00	37.00	37.00	37.00

	Jan. 14, 1932	Dec. 1932	Oct. 1932	Jan. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.55
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.81
Iron bars, Chicago	1.65	1.65	1.65	1.60
Shapes, Pittsburgh	1.60	1.55	1.60	1.55
Shapes, Philadelphia	1.75	1.75	1.75	1.65
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.60	1.55
Tank plates, Philadelphia	1.69	1.69½	1.79½	1.69½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.60	1.70	1.70	1.75
Sheets, No. 24, hot ann., Pitts.	2.00	2.10	2.10	2.20
Sheets, No. 24 galvan., Pitts.	2.75	2.85	2.80	2.80
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	2.00
Sheets, No. 24 hot ann., Chi.	2.25	2.25	2.25	2.45
Sheets, No. 24 galvan., Chi.	2.90	2.90	2.90	2.95
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.75	4.75
Scrap				
Heavy melting steel, Pitts.	$8.50	8.70	9.50	10.25
Heavy melting steel, eastern Pa.	6.50	6.60	7.25	7.50
Heavy melting steel, Chicago	5.25	5.45	6.00	7.25
No. 1 wrought, eastern Pa.	6.50	6.60	7.25	9.35
No. 1 wrought, Chicago	5.00	5.05	5.60	7.25
Rails for rolling, Chicago	8.25	8.25	8.00	10.30

Sheets

Automotive Orders Holding Up Better Than Expected—Users Begin to Replenish Stocks

SHEET PRICES, PAGE 29

Cleveland—Orders for automotive sheets are holding up better than anticipated. Additional releases were received continuing sheet mill operations around 35 per cent. The material is for quick shipment, and the hand-to-mouth character of this business leaves mills conjecturing as to how long it will be maintained, much depending upon the public reception of the new cars. Approximately 3500 tons of sheets, half enameling and half cold rolled, will be purchased shortly for refrigerator shells on orders from two manufacturers booked recently by Truscon Steel Co., for fabrication in Cleveland. A reaction from the low-inventory stage is noted, in better demand to replenish stocks for barrel and household equipment units. Some confusion still is apparent in the trade regarding the policy recently adopted by certain mills in selling sheets for autobody purposes on the cold-rolled sheet price basis. These mills will continue to roll standard autobody when specified, the buyer to pay the extra 15 cents per 100 pounds for inspection. An effort now is being made to sell cold rolled sheets suitable for autobody use, run-of-mill, the consumer to accept the seconds. Previously the mill assorted autobody sheets for primes and seconds, the customer paying for the seconds generally 10 per cent less than the primes. No change has been made in gage and size differentials as between cold rolled and standard autobody. Some width extras have been revised on hot and cold rolled by several mills. Extras for Nos. 19 and 20 gage, 42 inches and wider, go into the same brackets as Nos. 17 and 18 gages. These revisions result in a reduction of 10 cents per 100 pounds.

Boston—Wetherell Bros., Cambridge, were low on galvanized sheets for the Massachusetts state purchasing bureau, bidding 3.17c delivered for No. 24; 3.42c for No. 26; and 3.07c for No. 22.

Philadelphia — While more interest is noted in the market particularly for autobody sheets, prices generally have softened. The principal weakness appears in the cold rolled sheets.

New York—Most grades of sheets have been nominally reduced. No. 24 hot rolled annealed now are 2.35c to 2.45c, delivered; No. 10 hot rolled, 1.80c to 1.90c; and galvanized, 3.10c to 3.20c. Sellers see few signs of improvement.

Pittsburgh—Specifications for all grades of sheets total the same as in the first 15 days of December. Little automotive business is coming to this district. Mill operations remain around 10 per cent. Allegheny Steel Co. shipped about 480 tons of steel sheets for making drums, from its Brackenridge, Pa., plant to New Orleans destinations last week. Black sheets remain 2.00c to 2.20c; and No. 24 galvanized, 2.75c to 2.85c.

Cincinnati — Inquiry for sheets continues moderate, but orders for rush shipments are maintained. Opations are close to the December rate.

Chicago—Sheet prices in the Chicago market are relatively steadier than in eastern districts. Weakness has developed in galvanized sheets which now generally are 2.85c, base, but recently prevailing quotations are adhered to on other grades. Orders reflect the unwillingness of consumers to purchase beyond immediate requirements. Total business has changed but slightly so far this month. Sheet mill operations are unchanged at 10 to 15 per cent.

St. Louis—Sheet producers and distributors report business thus far this year slightly better than in the comparable period in December.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.45c to 1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, delivered	1.70c
*New York, delivered	1.80c to 1.90c
Birmingham, base	1.70c
*Philadelphia, delivered	1.76c to 1.86c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.60c to 1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
*Philadelphia, delivered	1.91c to 2.01c
*New York, delivered	1.95c to 2.05c
St. Louis, delivered	2.04c
Birmingham, base	1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.00c to 2.20c
Gary, Ind. Harbor, base	2.20c to 2.30c
Chicago, delivered	2.25c to 2.35c
*New York, delivered	2.35c to 2.45c
*Philadelphia, delivered	2.31c to 2.41c
Birmingham, base	2.35c
St. Louis, delivered	2.54c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.28½c

GALVANIZED No. 24

Pittsburgh, base	2.75c to 2.85c
*Gary, Ind., Harbor, base	2.85c to 2.95c
*Chicago, delivered	2.90c to 3.00c
*Philadelphia, delivered	3.06c to 3.16c
*New York, delivered	3.10c to 3.20c
Birmingham, base	3.00c
St. Louis, delivered	3.19c
San Francisco, c.i.f.	3.50c

AUTOBODY No. 20

Pittsburgh, base	2.55c to 2.65c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, delivered	2.67½c

HEAVY COLD ROLLED No. 10

Pittsburgh, base	1.90c to 2.00c
Gary, Ind. Harbor, base	2.10c
Chicago, delivered	2.15c
*Philadelphia, delivered	2.21c
*New York, delivered	2.25c to 2.35c

COLD ROLLED No. 20

Pittsburgh, base	2.40c to 2.50c
Gary, Ind. Harbor, base	2.60c
Chicago, delivered	2.65c
*Philadelphia, delivered	2.71c
*New York, delivered	2.75c to 2.85c

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95

(Per pound)

Polished staples	2.65c
Galvanized staples	2.90c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing (9-11 gage)	$55.00
(12½ gage and lighter)	$60.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
Philadelphia, del.	1.69½c to 1.79½c
New York, delivered	1.80c to 1.90c
Boston, delivered	1.92c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
Coatesville, Pa., base	1.60c to 1.70c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, delivered	1.75c
New York, delivered	1.87c
Boston, delivered	2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
Pittsburgh, cold finish	1.75c
Pittsburgh, forg. qual.	1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
Eastern mills	1.35c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts. billet cut lengths	1.65c
Pitts., stock lengths mill	1.50c
Chicago, billet	1.50c to 1.60c
Chicago, rail steel	1.20c to 1.30c
*Philadelphia, cut lengths	1.81c to 1.96c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base Pittsburgh for one size, shape and grade for shipment at one time to one destination

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
*Long ternes, 24 unassorted	2.70c to 2.80c

Gary Ind., base 10 cents higher

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base, 2.45c to 2.65c. Differentials to various classes of consumers

S.A.E.	Alloy Diff.		
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2500	1.50	5100 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.30	Cr., Ni., Van.	1.50
3400	3.20	Carbon van	0.95
4100 .15 to .25 Mo.	0.50	9250 (flats)	0.25
		9250 (rds., sq.)	0.50
		4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c to 1.81c
Do., del. New York	1.80c to 1.85c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Cold roll. strip, Pitts., Cleve.	2.00c
Worcester, 3 tons or over	2.20c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleveland	70, 10 and 5 off
Washers, c.l., Pitts. dist.	$6.50 to 6.75 off
Do., Chicago district	7.00 to 7.50 off

Rails, Track Material

Standard rails, mill	$40.00
Relaying rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	23.00 to 25.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55c
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pittsburgh	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-25 off
Upset 1 in. diam. and smaller 80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller ..... 75-10-10 off
Headless set screws ..... 75-10 off
Upset, larger than 1 in. ..... 75-10 off

Cut Nails, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.65
Steel sheet piling, Pitts.	1.90c

Bars

Buying Shows Little Change, Automotive Needs Being Best Support—Prices Hold Well

BAR PRICES, PAGE 29

Chicago — Moderate improvement in inquiry for soft steel bars and sustained demand from the automotive industry leave the market in only a slightly better state of activity than for several weeks. Specifications from farm implement manufacturers have yet to show a definite upturn. Automotive requirements are most active, with only slight gains noted in orders from miscellaneous consumers. Better activity in sales to small users is anticipated over coming weeks. Soft steel bars continue 1.70c, Chicago. Bar iron continues slow with the market usually 1.60c, base. Rail steel bars continue 1.50c.

Pittsburgh—No important gain in automotive buying has appeared and both alloy and merchant bars maintain about the same rate in shipments and specifications as during early December. One mill here reports better bookings, in fact as good as any received last fall, but they are diversified over many hot-rolled products, including bars. After having been closed since the day after Christmas, the local bar mill of the leading interest resumed last week with three open hearths. Prices are unchanged at 1.60c for soft steel bars and 2.45c to 2.65c, mill, the alloy bar base.

Boston—Part of 305 tons of steel bars for the navy, bids Jan. 24, are for Boston and Portsmouth, N. H. Most requirements call for medium black grade M bars, mostly flats and rounds, 189 tons.

Cleveland—Bar mills have experienced a good week in new orders following the let-down in business during the holidays. Individual requirements are small, with automotive specifications leading. Bars are steady at 1.60c, base, Pittsburgh.

Tin Plate Operations Now Up to 50 Per Cent

Tin Plate Prices, Page 29

Pittsburgh—For the third consecutive week tin plate operations have improved another 5 points, now averaging 50 per cent. Although the leading interest is running at less than this average, independents are close to 60 per cent. Canmakers' specifications are coming in more uniformly, affording mills more regular operations. The price is firm at $4.25, per base box. Not all of production at present is for immediate shipment and all mills are producing some tin plate for stock.

Cold-Finished Trade Is On Par with December

Cold Finished Prices, Page 29

Pittsburgh — Specifications and shipments of cold-finished bars are so close to those of the first half of December that the differences are a matter of a few tons. There appears little incentive to buy by automotive builders, although partsmakers show relatively more improvement. The price is firmly held, 1.70c being the minimum for 5 to 10-ton lots. Differentials are reported being held.

Ahead in Alloy Steels

Alloy Prices, Page 29

The volume of business in hot rolled alloy steels so far this month is slightly ahead of that in the comparable period of December, due to a continuation of orders from the automotive industry. Little interest is manifested by the oil industry or other important groups. The market is firm at 2.45c to 2.65c, base, mills, the former the usual price to quantity consumers.

Plates

Barge Requirements More Active, with 1500 Tons Placed—Brewery Work Is Slow

PLATE PRICES, PAGE 29

Chicago — Although inquiry for miscellaneous fabricated plate products is slightly more active, orders are slow. Inquiries from oil companies are limited principally to improvement and rehabilitation work rather than new construction. Water tank building is confined principally to federal projects. Plates nominally continue 1.70c, Chicago.

Boston — Plate fabricators are buying little material and generally in small lots. Shading is more in evidence, even on smaller tonnages. A small tonnage is out for delivery to the Boston and Portsmouth, N. H., navy yards.

New York—Plate orders are more numerous, but tonnage shows little change over recent weeks. Makers are figuring on a substantial amount for eight welded plate cylinder gates, 32 feet in diameter, 10 feet high, for intake towers at the Hoover dam, Boulder, Nev., bids Jan. 27 to bureau of reclamation, Denver. The carlot price is easy at 1.60c to 1.70c, Coatesville.

Philadelphia — While the Sun Shipbuilding Co., Chester, Pa., appears to be low on the ferryboat for the Virginia Ferry Corp., Norfolk, Va., no official action has been reported. As previously noted, this vessel will require about 700 tons of plates. Close to 100 tons of plates and also 100 tons of castings, will be required for a condenser recently awarded to the Westinghouse Electric & Mfg. Co. for the Philadelphia Electric Co.

Pittsburgh — Six cargo barges requiring 1500 tons of plates were placed recently with American Bridge Co. here. More government work is coming out for figures with 300 tons of plates required for 40 steel pontoons to be closed Jan. 26 by the Vicksburg, Miss., engineers. Plans are being prepared for two steel barges for Mobile, Ala., to take about 300 tons. Midland Barge Co., Midland, Pa., is low at $129,800 on an agitator dredge for Vicksburg, Miss., the job requiring 350 tons.

Cleveland—A 152-inch plate mill here idle for several weeks resumed Jan. 12, mainly for railroad requirements. Considerable miscellaneous business is still held in abeyance, in some quarters reported due to uncertainties regarding the new Washington administration policies. Some small lots of plates were placed during the week by users whose stocks were practically depleted. The price is steady at 1.60c, base, Pittsburgh.

Contracts Placed

1500 tons, six cargo barges, 160 x 34 x 8 feet for Barrett Lines Inc., Cincinnati, to American Bridge Co., Pittsburgh.
250 tons, lighthouse tender HEMLOCK.

to Berg Shipbuilding Co., Seattle, delivery, Seattle, $228,480.60, bids Nov. 29.

200 tons, four 1000-horsepower boilers, Mare Island, Calif., Consolidated Steel Corp., Los Angeles; through Foster Wheeler Corp., New York.

Contracts Pending

700 tons, ferryboat for Virginia Ferry Corp., Norfolk, Va.; Sun Shipbuilding Co., Chester, Pa., reported low

350 tons, agitator bridge, delivery to Vicksburg, Miss.; Midland Barge Co., Midland, Pa., low at $129,800 for completion in 170 days. Dravo Contracting Co., Pittsburgh, second, with $136,650, 110 days.

300 tons, 40 steel pontoons, for flood control work, each 26 x 12 x 3 feet; bids by federal engineers, Vicksburg, Miss., Jan. 26.

300 tons, aproximately, two steel barges 100 x 24 x 7 feet; plans being prepared by federal engineers, Mobile, Ala.

300 tons, 40 pontoons for 16-inch steel pipe line, complete with trucks, delivered afloat, Vicksburg, Miss., bids Jan. 26. United States engineer, that station.

250 tons, approximate, plates and castings, 77 buoy bodies, 5 x 15 feet to 9 x 38 feet, skeleton lantern tower and bottom counterweight, for government; Biggs Boiler Works, Akron, O., to be recommended for contract.

100 tons, condenser for Philadelphia Electric Co., Philadelphia, to be built by Westinghouse Electric & Mfg. Co., at Philadelphia plant.

Unstated tonnage, 175 steel buoys; bids by Chicago federal engineers Jan. 19.

Obituaries

(*Concluded from Page* 13)

works at Gary, Ind., for three years, returning to the Manitowoc yards in 1925.

□ □ □

Frank W. Waite, head of the F. W. Waite Mfg. Co., Springfield, Mass., died Jan. 8. He made numerous inventive contributions to the wire fabricating field.

□ □ □

Thomas Cunningham, who entered the iron business in Boston in 1850 with his father, Thomas Cunningham, and after the latter's death reorganized as the Cunningham Iron Works Co. and removed to South Boston, retiring in 1910, died at Boston recently.

□ □ □

John J. Hartley, 39, western division chief engineer, Link-Belt Co., Chicago, died Dec. 31, innocent victim of an assassin's bullets. He had been connected with Link-Belt's Pershing road plant, Chicago, for the past 23 years, having entered the company's drafting room as a boy. Following a liberal experience in both the engineering and construction departments, he also served the company as sales engineer, and in 1929 was promoted to the position of chief engineer of the western division.

□ □ □

Miss Kate Gleason, head of the Gleason Gear Works, Rochester, N. Y., and first woman member of the American Society of Mechanical Engineers, died at Rochester, Jan. 9.

In her early years Miss Gleason evidenced interest in machine shop practice and business management, at the age of 11 devoting leisure time to keeping books in her father's gear works. At 25 she left Cornell university and her course in engineering to become secretary and treasurer of her father's plant, having become indispensable. In addition to her interest in her own industry she was the first woman president of a national bank in the United States. James E. Gleason, president and Andrew Gleason, vice president, of the Gleason works, are her brothers.

Railroads

Some Spike Demand Develops —Other Needs Are Small—Total Freight Cars 1739 in 1932

TRACK MATERIAL PRICES, PAGE 29

New York—Buying of rolling stock remains at a standstill, although better buying by railroads, particularly for track repairs, is expected soon. Bids were opened Jan. 13 by the local board of transportation on approximately 7000 tons of rails.

Final figures for 1932 indicate the placing of 1739 domestic freight cars, against 10,694 in 1931, 45,146 in 1930, and 106,105 in 1929. The best month was September, when 1298 cars were awarded, most for the Pennsylvania to its own shops. A comparative statement follows:

	1932	1931	1930	1929
Jan.	159	100	5,072	13,196
Feb.	35	50	17,027	15,944
March	105	2,166	6,118	12,023
April	0	2,798	1,997	8,205
May	60	20	1,392	7,562
June	0	1,910	998	5,886
July	25	617	1,389	341
Aug.	5	1,304	1,111	2,854
Sept.	1,298	703	576	4,517
Oct.	0	980	4,116	19,506
Nov.	2	35	2,621	6,361
Dec.	50	11	2,729	9,710
Total	1,739	10,694	45,146	106,105

New York Central has distributed 5000 car wheels. Its inquiry for rails may not be made until March.

Pittsburgh — The local rail mill, according to expectations, has a tentative schedule for late January or early February rolling but no definite releases have come through to allow formation of a schedule. Considerable hinges on anticipated releases of a large eastern road. Some slight activity is noted in fastenings with the Pennsylvania railroad nominally inquiry for a round tonnage of spikes. None of the order of 5000 kegs of spikes by the Atlantic Coast Line came to Pittsburgh mills as two southern suppliers took the business. The spike market is uniformly 2.40c, mills, and tie plates are $35 per ton, although there has been no recent business in the latter since an award a few weeks ago by the Seaboard Air Line. Several railroads are inquiring for screw spikes, including a large inquiry by the Chesapeake & Ohio. Light rails are nominally $30 per ton and standard open-hearth rails $40. The Boston & Maine's inquiry for 5000 to 6000 kegs of spikes is in error and the road does not contemplate purchase of rails or track fastenings for at least several months. The road has not yet laid about half of the rails ordered in November, 1931, and its only recent purchase has been a carload of spikes for a small rail-laying project.

Cleveland—Chesapeake & Ohio railroad here has issued an inquiry for screw spikes for delivery as required this year, variously estimated at 1,500,000 to 2,500,000. Release was given some time ago on several carloads on a previous order. No rail inquiries are in immediate prospect from carriers with headquarters here, and purchases continue limited to miscellaneous steel requirements for repair purposes.

Chicago—While track fastening inquiry and releases are slightly more active, new business in these products, rails and equipment is slow to improve. Rail mill operations continue on recent light schedules, but indications point to no early improvement in rail orders. Car and locomotive repair work is slow and steel purchases for this work generally are unimproved. Possibilities of some increase in car wheel buying is seen in refusal of some roads to sell this material for scrap instead of exchanging with car wheel manufacturers for new units.

Car Orders Placed

California Despatch Line, three 10,000-gallon tank cars to American Car & Foundry Co.

Structural Shapes

Public Work Shows Tendency to Subside, Awards Again Declining — Pittsburgh Looks for Improvement in Mill Operations— 30,000 Tons in New York

STRUCTURAL SHAPE PRICES, PAGE 29

New York — Pending New York state bridge steel contracts are gradually being placed, reducing the volume active in that direction. More than 30,000 tons are up for two projects, St. John's Park warehouse and the federal building superstructure. New York state hospitals taking close to 1000 tons have been awarded. Fabricated structural steel prices are irregular, and plain material is shaded frequently on the smaller lots.

Boston—Close to 15,000 tons of shapes will be required for a suspension bridge over the Connecticut river at Hartford, Conn., tentative bids going in Feb. 15, although final action depends on legislation. A heavier volume of small jobs is pending in New England. Fabricated steel prices reflect easiness in plain material.

Philadelphia—Decline in federal and state work is more pronounced, and private construction is at a decidedly low ebb. Shapes are unchanged at 1.70c, nearest mill, although easier, and fabricated material prices are soft. New bids will be opened Jan. 17 on 2000 tons for a hospital for the University of Maryland, and Feb. 16 on 800 tons for a postoffice at Charlotte, N. C. James G. Dempsey, Philadelphia, has been awarded contracts for inspection of structural steel for the Archives building, Washington, and the Albany postoffice, aggregating 10,000 tons.

Pittsburgh—Fabrication of 60,000 tons for the New Orleans belt line bridge in this district is not expected to get under way for approximately 60 days. Structural activity was more pronounced last week and shape mill operations are expected to gain in the next two weeks. The market is firmer than in some months.

Cleveland—A Cleveland general contractor has awarded 685 tons of shapes for a reformatory at Elmira, N. Y., to the Ingalls Iron Works Co., Verona, Pa. New state work is slow, with some minor requirements pending, and private projects are scarcer. The city council has called for a report this month from the commission planning the straightening of the Cuyahoga river, for which a bond issue has been voted, and which fabricators estimate will require rebuilding or new construction of bridges requiring approximately 3000 tons.

Cincinnati — Bids are being taken on moderate tonnages for several public jobs in Kentucky.

Chicago — Activity in fabricated structural steel is quieter than during the preceding several weeks. The few projects local fabricators are figuring consist almost entirely of small highway bridges. Practically no private work is appearing.

Contracts Placed

750 tons, highway bridge, Sawyer, Okla., to Muskogee Iron Works, Muskogee, Okla.

750 tons, highway bridges, Indiana, to Vincennes Bridge Co., Vincennes, Ind.

685 tons, reformatory, Elmira, N. Y., to Ingalls Iron Works Co., Verona, Pa., through W. F. Hendrich Co., Cleveland general contractor.

650 tons, state highway bridges, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City.

500 tons, state bridge, Hancock-East Branch, N. Y., Delaware county, RC 3408, to American Bridge Co., Pittsburgh; Stanley Contracting Co., Brooklyn, N. Y., general contractor.

460 tons, Bank of Savings, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; Marc Eidlitz & Son Inc., general contractor.

375 tons, beams and trusses, Oklahoma state highway department, to Muskogee Iron Works, Muskogee, Okla.

350 tons, state armory, Binghamton, N. Y., to Pittsburgh Bridge & Iron Works, Pittsburgh; through Shutrump & Sons, Youngstown, O.

273 tons, alterations to Merchants Refrigerator Co. building, New York, to Belmont Iron Works, Philadelphia.

215 tons, powerhouse, segregation building and tunnels, Great Meadow prison, Comstock, N. Y., to Kellogg Structural Steel Co., Buffalo; through Amsterdam Construction Co.

190 tons, warehouse, Alameda, Calif., to Herrick Iron Works, Oakland, Calif.

175 tons, highway bridge, Knox county, Missouri, to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, state bridge, Darien Center-Alexander section, Genesee county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; John Petrossi Co. Inc., Rochester, N. Y., contractor.

170 tons, storage warehouse, East Twenty-second street, New York, to Grand Iron Works Inc. (Bronx) New York.

160 tons, addition, New England Deaconess hospital, Brookline, Mass., to New England Structural Co., Everett, Mass.; George B. H. Macomber Co., Boston, general contractor. Project takes 40 tons of reinforcing bars.

150 tons, coal bunkers, Armour & Co., Chicago, to Hansell-Elcock Co., Chicago.

145 tons, Summit avenue overpass, Ft. Worth, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

110 tons, bridge, Springfield, Ill., for New York Central railroad, to R. C. Mahon Co., Detroit.

Awards Compared

	Tons
Awards, week ended Jan. 14	**6,283**
Awards, week ended Jan. 7	**7,965**
Awards week ended Dec. 31	**9783**
Awards this week in 1932..	**12,333**
Av. weekly awards, 1932.....	**14,285**
Av. weekly awards, 1933	**7,124**
Av. weekly awards, Dec.....	**31,804**
Total awards to date, 1932....	**29,440**
Total awards to date, 1933....	**14,248**

Contracts Pending

10,000 tons, superstructure, federal courthouse, New York; James Stewart & Co., New York, low granite, $5,996,000; N. P. Severin Co., Chicago, low, limestone, $5,543,000.

5000 tons, estimated, postoffice and courthouse, St. Paul; bids Feb. 16.

2000 tons, approximately, state hospital, Gowanda, N. Y.; general contract awarded to C. F. Haglan & Sons Co., and Winston Bros., Minneapolis, on joint low bid of $1,947,000.

2000 tons, hospital, University of Maryland, Baltimore; bids Jan. 17; also 300 tons of reinforceing bars.

1025 tons, including 564 tons of sheet piling, 334 tons of structural steel, 127 tons of castings and special metal work, 10 tons of bolts, for lock and dam No. 5, Green river, Ky.; Frazier-Davis Construction Co., St. Louis, low; bids Jan. 5. Work also includes 74 tons of reinforcing steel.

1000 tons, two grade separations in Los Angeles; Consolidated Steel Corp., Los Angeles, low.

900 tons, bridge, Choptank river, Caroline county, Maryland, contract Co-71-27, department of public works, Baltimore; Sanford & Brooks, Baltimore, low, bids Jan. 10. Bridge includes three 215-foot spans.

800 tons, postoffice, Charlotte, N. C.; bids Feb. 16.

610 tons, bridge over Colorado river, Mesa county, Colorado; bids Jan. 29.

450 tons, postoffice, San Jose, Calif.; bids Feb. 17.

450 tons, highway bridge, Iron Mountain, Mich.

400 tons, bridge over Green river, Jensen, Utah.

343 tons, including 280 tons medium black angles, channels and shapes and 63 tons of galvanized angles for navy; bids Jan. 24.

300 tons, postoffice, Tyler, Tex; Ralph Sollitt & Sons Construction Co., Chicago, low, $237,400.

300 tons, bridge, Saugerties village, highway 5601, Ulster county, New York; Morrell Vrooman Inc., Gloversville, N. Y., low, bids Jan. 10.

265 tons, building, University of Iowa, Iowa City, Iowa.
200 tons, shapes and plates, Panama. 73 tons, shapes, Bethlehem Steel Export Corp., low; 54 tons, shapes, United States Steel Export Corp., low; 73 tons, plates, Central Iron & Steel Co. low. Bids Jan. 9.
150 tons, concrete bridge with hand operated structural steel span and approaches, bureau of yards and docks, Newport, R. I.; bids Jan. 25.
150 tons postoffices, Norwood, Mass., and Somerville, N. J.; bids Feb. 9 and 8, respectively.
150 tons, plate girder span for Chicago, Burlington & Quincy railroad.
150 tons, draw bridge, bureau of yards and docks, Newport, R. I.
140 tons, federal bridge, Bureau county, Illinois; Wisconsin Bridge & Iron Co., Milwaukee, low.
102 tons, steel sluice gates, walks and tracks, Cedars Dam, Fox river, Kimberley, Wis.; United States engineer, Milwaukee.
100 tons or more, steel piling, bulkhead wharf, Chesapeake city harbor, Chesapeake and Delaware canal, United States engineer, Wilmington, Del.; bids Jan. 31.
Unstated tonnage, addition to nurses' home and a building for noncommissioned officers, Walter Reed hospital, Washington; bids Jan. 20.

Wire Buying Light but Shows Moderate Increase

Wire Prices, Page 29

Chicago—A small seasonal upturn is noted in specifications for wire products, some jobbers increasing stocks moderately, following inventory period. Activity in manufacturers' wire is slow and unchanged and total business is increasing somewhat more slowly than usual for this period. Prices are well maintained at $2 for carload lots of wire nails and 2.25c for plain wire.

Worcester, Mass.—Improvement in demand for wire is slow, although some slight gains are noted. Demand is spotty and buying for January shipment is light. Prices are firm on most wire products with plain wire unchanged at 2.30c, Worcester.

Pittsburgh—Improvement in wire specifications developed last week although considerable tonnage still overhangs the market awaiting release. This is shown by requirements of most customers being held to carload lots or less when price advantages would apply on straight carload specifications. One large wire producer here still is closed, having gone down before Christmas, and operations in independent mills average not more than 12 to 15 per cent. Prices generally are $1.95 in straight carloads for nails and base of 2.20c for plain manufacturing wire.

Cleveland—Interest is more apparent on the part of manufacturers whose inventories were at a minimum over the year-end, but it now appears some users kept up stocks expecting to be in a better position to give quick delivery of finished products and these are not now in the market. Those serving the automotive industry were in the latter class; hence a relatively better demand from the general manufacturing trade than from automotive. Some fairly substantial orders have been placed recently. Though the market here is firm at 2.20c for plain wire, competitive conditions in western Ohio are reported to have brought out 2.10c from at least one other source.

Concrete Bars

Volume Is Heavier in East, But Comprised of Small Lots—Change in Illinois Public Offices Defers Action on 3000 Tons—3800 Tons Pending for Los Angeles

REINFORCING BAR PRICES, PAGE 29

New York—Concrete bar awards are heavier, led by close to 600 tons for the Kings Park, N. Y., state hospital buildings, and several highways and bridges. Efforts to hold billet bars to 1.60c, Pittsburgh, mill lengths, and 1.75c, cut lengths, are meeting with difficulty as several lots have moved under these figures.

Boston—Pending volume in New England is substantial, largely for highways and bridges. Billet and rail steel bars are fairly steady, but highway fabric and bar reinforcement are easy.

Philadelphia—Award of 650 tons of reinforcing bars for the local customs house is the only outstanding purchase in this market. Inquiry is light. Billet steel in cut lengths now is holding at a spread of 1.81c to 1.96c, delivered, in car lots.

Pittsburgh—More than 1000 tons of concrete bars are pending for 10 or 12 small jobs in adjoining eastern districts. In addition, 1000 tons will be purchased for the two narcotic buildings at Lexington, Ky., a federal project. Volume booked in lots of less than 75 tons is fair. Prices are on the new basis of 1.50c, Pittsburgh, for mill length of new billet bars.

Washington — Milton Mfg. Co., Milton, Pa., is completing delivery of 700 tons of reinforcing bars for the Central heating plant here for which the Northeastern Pipe & Construction Co., North Tonawanda, N. Y., is general contractor and the Marocco Construction Co., Baltimore, subcontracter for concrete work. United Engineers & Constructors Inc., Philadelphia, are engineers.

Cleveland—A New York city fabricator will supply 475 tons of concrete bars for the Elmira, N. Y., reformatory, awarded by a Cleveland general contractor. The market here is quieter than in many weeks. State bridge work, requiring approximately 300 tons, is pending. Mill lengths of new billet steel bars are 1.40c to 1.50c, base, Cleveland.

Chicago—Little pending work in reinforcing bars is up for early closing. The change in administration is expected to defer action on about 3000 tons for Illinois road work, while bars for several federal dams have yet to be placed.

Awards Compared

	Tons
Awards, week ended Jan. 14	**3,819**
Awards, week ended Jan. 7	**6,867**
Awards, week ended Dec. 31	**2,224**
Awards, this week, 1932	**3,315**
Av. weekly awards, 1932	**3,920**
Av. weekly awards, 1933	**5,343**
Av. weekly awards, Dec.	**2,370**
Total awards to date, 1932	**16,973**
Total awards to date, 1933	**10,686**

Contracts Placed

650 tons, customs house, Philadelphia; placed through McCloskey & Son, that city, with Concrete Steel Co., New York.
600 tons, buildings, state hospital, Kings Park, N. Y., to Kalman Steel Corp., Bethlehem, Pa.; Seglin Construction Co., New York, general contractor.
475 tons, reformatory, Elmira, N. Y., to George R. White Inc., New York; through W. F. Hendrich Co., Cleveland, general contractor.
381 tons, highway, Burnham-Pittsfield, Me., to Bancroft & Martin Rolling Mill Co., Portland, Me.; through D. M. Susi, Pittsfield, general contractor.
260 tons, highway, Buffalo-Millersport, part 2, Erie county, New York, to Wickwire-Spencer Steel Co., New York; through Roadway Trucking Corp., Williamsville, N. Y., contractor.
250 tons, tunnel work, Newark, N. J., to Faitoute Iron & Steel Co., Newark.
210 tons, high level reinforced concrete sewer, Mt. Ida, Newton, Mass.,

to connect with Boston metropolitan district extension, two-thirds to Barker Steel Co., Boston, one-third to Truscon Steel Co., Youngstown, O.; T. Stuart & Son Co., Watertown, Mass., general contractor.

200 tons, William Land school, Sacramento, Calif., to unnamed interest.

170 tons, mesh, highway, Antwerp to Jefferson county line, New York, to American Steel & Wire Co., New York; through Arborio Road Construction Co. Inc., Hartford, Conn.

165 tons, state bridge, Sawyor county, Oklahoma, to Capitol Steel & Iron Co., Oklahoma City, Okla.; through Keleher Construction Co., Dallas, Tex., contractor.

163 tons, two state bridges in San Diego county, California, to unnamed interests.

150 tons, bridge, Darien Center-Alexander, N. Y., to Kalman Steel Corp., Bethlehem, Pa.; through John Petrossi Co. Inc., Rochester, N. Y.

145 tons, bar reinforcement, mesh and fabric, highway, Sunrise highway extension, part 5, Islip avenue, Suffolk county, New York, to Capital Steel Corp., New York; Restelli Contracting Co. Inc., Flushing, N. Y., general contractor. Other material, including 20 tons of castings and 310 feet of metal railing, unplaced.

Contracts Pending

6000 tons, approximately, state hospital, Gowanda, N. Y.; general contract awarded to C. F. Haglan & Sons Co., and Winston Bros., Minneapolis.

3838 tons, San Gabriel dam No. 1, Los Angeles county, California; general contract to West Slope Construction Co., Chicago.

1000 tons, two buildings, federal narcotic farm, Lexington, Ky.

400 tons, reinforced concrete and riprap superstructure, 11,540 feet on Pea Patch island dike, Delaware river, below New Castle, Del.; bids Jan. 31 to United States engineer, Philadelphia.

365 tons, state highway work in San Bernardino county, California; bids Jan. 25.

300 tons, hospital, University of Maryland, Baltimore; bids Jan. 17. Approximately 2000 tons of shapes also required.

288 tons, for Panama; Gulf States Steel Co., Birmingham, Ala., low, $9997.50, delivered, bids Jan. 5. Some mill awarded 75 tons on previous opening at $2917.50, delivered.

152 tons, state highway work in Los Angeles county, California; bids Jan. 11.

110 tons, state highway work in Orange county, California; bids Jan. 25.

104 tons, United States engineer, Milwaukee; bids Jan. 17.

Unstated but substantial tonnage, vault, treasury department, Washington; bids Feb. 2.

Unstated tonnage, grade elimination and trestle work for Erie railroad, Elmira, N. Y.

Mirrors of Motordom

(*Concluded from Page* 11)

and emery wheels. It was called to attention of metallurgists by Charles C. Berg, formerly chief engineer of the International Nickel Corp., now a mining engineer at Beverly Hills, Calif.

Pierce-Arrow and Indiana trucks are now coming off the line at the White plant in Cleveland, to which these truck divisions of Studebaker were transferred following the merger of Studebaker and White. Sales of White trucks in December totaled 181, best month since June. . . . General Motors of Canada Ltd., is doing body welding by hand instead of machinery in order to spread work. . . . A large number of Buick dealers are now also selling Pontiacs. . . . There is a trend toward smaller crankcase capacity of oil in 1933 models, Plymouth for example going to 5 quarts on account of its cross-steering mechanism. . . . Paul Mackall, vice president, Bethlehem Steel Co., estimates that 50 man-hours are assured the steel industry for every Chevrolet that is ordered.

Pipe

Los Angeles Orders 4000 Tons —Washington Buying 1400— Southern Plants at Low Rate

PIPE PRICES, PAGE 44

Pittsburgh — Specifications for some tubular products improved last week, although oil country goods and line pipe were quiet. Prospects are not favorable for stable conditions in the oil industry over the next 60 to 90 days. Although one important oil refiner is reported inquiring for a sizable tonnage of line pipe, no definite awards have been noted here since Republic Steel Corp. took an order for 4000 tons of spiral electric-welded pipe for Los Angeles last week. Specifications in general to the tubular product makers are holding up to the December level but some mills are experiencing a reversal in demand for their more specialized products.

Boston—Boston is taking new bids on 1200 tons of cast pipe and 225 tons of iron castings, Jan. 18. Inquiry is light as few municipalities have figured requirements.

New York — Eastern cast pipe foundries are operating at 25 to 30 per cent with light backlogs. Washington is taking figures on 1400 tons. Prices are untested at $30 to $32, eastern foundry.

Cleveland—The general contract for plumbing in the new Cleveland postoffice has been placed with Jacob Feldman, Cleveland, requiring approximately 200 tons; the contract for heating not having been awarded as yet. Orders for steel pipe are limited to occasional carlots.

Chicago—While prospective work requiring cast iron pipe is accumulating, few inquiries are appearing and orders remain extremely light. Action is deferred on the few projects pending in this district. Plans of leading cities of the Middle West for waterworks improvements are indefinite.

Birmingham, Ala.—The majority of pipe plants in this district are operating at an average of two days a week, and no improvement is anticipated in the near future. Stocks have not been reduced much in recent months.

Cast Pipe Placed

610 tons, 6-inch class 150, San Francisco, to Central Foundry Co., Birmingham, Ala.

550 tons, 4 to 12-inch, Corpus Christi, Tex., to National Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

1400 tons, 4 to 16-inch, district commissioners, Washington; bids Jan. 19. Also 558 feet, 21.60-inch steel pipe and 22 couplings.

1200 tons, 8 to 16-inch, Boston, bids Jan. 18, readvertised; also 225 tons, iron castings.

197 tons, 2 to 8-inch class 150, Soledad, Calif.; bids Jan. 18.

Steel Pipe Placed

4000 tons, light spiral electric welded water pipe for metropolitan water district of southern California, Los Angeles, to Republic Steel Corp., Youngstown, O.

Unstated tonnage, 75 lengths, 20-inch welded pontoon pipe, United States engineer, Galveston, Tex., to Wyatt Metal & Boiler Works, Houston, Tex., $96.29 per length, delivered.

Steel Pipe Pending

2000 tons, mainly 18-inch steel pipe, foundation work, customs house, Philadelphia. Action expected soon through the Foundation Co., subcontractor, New York. Previously noted as 1500 tons.

100 tons, 2-inch and under galvanized wrought iron or steel standard, Panama; Albert Pipe Supply Co., Brooklyn, N. Y., low, bids Jan. 9.

Unstated tonnage, 1600 feet, 18-inch welded steel pontoon pipe, United States engineer, Memphis, Tenn., bids Jan. 20. For Vicksburg, closing Jan. 31, United States engineer, 1200 feet of ⅜-inch plate flanged steel welded discharge pipe.

Unstated tonnage, 2418 feet of extra strong, 4-inch and under, steel, and 1660 feet, extra strong, wrought iron, 4-inch and under, lock and dam No. 5, Green River, Ky.; Frazier-Davis Construction Co., St. Louis, low on general contract, $680,216.05.

Strip

Automobile Builders Supply Most Orders—General Users Not Increasing Purchases

STRIP PRICES, PAGE 29

Pittsburgh—Hot-rolled specifications show only minor improvement, although one mill here on a grouping of orders started last week with three hot mills operating several turns. The policy of alternate weeks production in mills here, however, still is being followed. Automobile releases are in small lots and the general trade is not appreciably increasing specifications. The cold-rolled base **price is 2.00c, Pittsburgh**, in most instances. Understood concessions, as always, prevail to large tonnage buyers, such as the automotive trade. Hot-rolled strip is 1.45c, Pittsburgh.

New York—Strip prices are fairly steady at 1.80c and 2.35c, delivered, on hot and cold-rolled, respectively.

Philadelphia—Strip is dull, prices at 1.76c and 2.31c, delivered Philadelphia. Radio manufacturers are specifying lightly. The Baldwin-Southwark Corp. is understood to be contemplating the production of ventilating equipment.

Cleveland—A considerable number of specifications were received here during the week, practically all of which were from automotive interests on contracts placed in December. New buying from these consumers is light. Cold rolled strip holds at 1.90c to 2.00c, base, Cleveland; and hot rolled, 1.45c to 1.50c, Pittsburgh.

Chicago—While strip steel shipments for automotive consumption are well maintained, demand from other consumers is slow to improve and total business has changed slightly since Jan. 1. Strip mill operations average around 15 per cent. Prices are fairly well maintained at 1.55c, Chicago, for hot strip, and 2.00c, Pittsburgh-Cleveland, for cold-rolled strip.

Steel Rate, Now 17, Better Than December's Highest

Pittsburgh—Steel operations here gained a point last week and as of Jan. 13 were at 14 per cent. According to backlogs of steel to be rolled the next two weeks, an improvement to 18 to 20 per cent is not unlikely by Feb. 1. Two large divisions of the leading interest here resumed last week after being down two weeks. Seven out of 53 steelworks blast furnaces are active. Percentage of finishing mill operations is averaging around 15 per cent. Open-hearth operations are expected to be resumed at the Toronto, O., plant of Follansbee Bros. Co. about Jan. 20.

Philadelphia.—A gain of more than 1 point brings eastern steelmaking operations up to 11-12 per cent, with prospects of a further increase this week.

Buffalo—Steelworks probably will operate at 22 per cent this week,

Operations, week ended Jan. 14	**17**
Operations, week ended Jan. 7	**15.5**
Operations, week ended Dec. 31	**13**
Operations, one year ago	**26**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9 & Dec. 24	**12**

tentative schedules, providing for eight active open hearths, compared with six, or 16 per cent, in the week ended Jan. 14. Republic is again staggering operations, accounting for the fluctuation. Bethlehem has placed a fifth open hearth in operation, an increase of two units since Jan. 1. Wickwire continues one furnace.

Youngstown, O.—District steel operations in the week ended Jan. 14 rose two points to 18 per cent, and are expected to gain a point or more this week. Twenty-one of 83 open-hearth furnace and two out of four bessemer plants are operating.

Cleveland—Steel ingot production for the week ended Jan. 15 was at 35 per cent, with Otis Steel Co., Corrigan, McKinney Steel Co. and American Steel & Wire Co. continuing with four active open hearths each. This rate is scheduled for the current week, sustained by additional automotive releases.

Chicago—Changes in steel plant operations are slight, with ingot production unchanged at around 10 per cent. Blast furnace schedules remain on the basis of seven active stacks, six of the 36 steelworks furnace being in blast. Finishing mill operations varied but slightly the past week.

Birmingham, Ala.—Steelmaking continues at 20 per cent, with no immediate change in prospect.

Warehouse Selling Makes Some Seasonal Gain

Warehouse Prices, Page 44

New York — Warehouse volume thus far this month has failed to increase. The last half of January is expected to show a material gain.

Philadelphia—Warehouse business is getting under way slowly, with prices officially unchanged. Jobbers are confident of further improvement this month.

Pittsburgh—Movement of steel products has increased slightly the past week following two weeks of extreme quiet. Galvanized sheets range between 3.90c and 4.00c out of stock, with black sheets quoted around 3.20c. Structurals and cold-drawn prices are unchanged.

Detroit—In the first ten days of January business in iron and steel out of warehouse has been substantially at the November-December level.

Cincinnati—Sales of warehouses here is showing only moderate improvement. Quotations are without change.

Chicago—Occasional slight gains are noted in warehouse sales, with additional improvement in prospect later in the month. Prices are steady and unchanged.

St. Louis—Beginning with the second week in January there has been noticeable improvement in the movement from warehouses. While volume still is light, there is evidence of demand.

Bolt, Nut Orders Slow as Users Delay Closing

Bolt, Nut, Rivet Prices, Page 29

Pittsburgh—Several railroads are withholding award on bolt and spike inquiries, although rivets have been moving to car shops of the same customers. Some railroad inquiries for screw spikes are becoming active. A large tonnage of lag bolts and rivets will be required for the New Orleans Belt Line bridge.

New York—Demand for bolts and nuts is the slowest in years. Aside from a heavy tonnage of alloy bolts for the cylinder gates at Hoover dam little is in prospect.

Cleveland—Automotive nut and bolt releases so far this month have not been as liberal as before Jan. 1. Railroad requirements are light, with little change from December.

Chicago—Bolt, nut and rivet specifications have changed little since a month ago.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$15.50
Pittsburgh, dist. furnace..	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.26 to 13.76
Virginia furnace	17.25
Granite City, Ill., furnace	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. Louis	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock delivery	15.00
Alabama, New York dock..	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinci.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local delivery	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Philadelphia	13.76 to 14.26

FOUNDRY, NO. 1X

Buffalo fur., local delivery	17.50
Eastern, del. Philadelphia	14.26 to 14.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo, fur., local del.	16.50
Eastern Penna, delivered..	14.63 to 18.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district furnace	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., delivered	13.50
Buffalo fur., local delivery	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

LOW PHOS.

Valley furnace, standard	25.00
*Philadelphia, standard	22.76 to 25.79
*Copper bear., E. Pa. fur.	20.50 to 21.50

GRAY FORGE

Valley furnace	14.00
Pittsburgh district furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville furnace	$1.75 to 2.00
*Connellsville foundry	2.50 to 4.00
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., delivered	8.21 to 8.81
Chicago, ovens, outside del	7.00
Chicago, delivered	7.75
New England, delivered	10.00
St. Louis, delivered	7.75
Birmingham, ovens	4.00
Indianapolis, delivered	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, delivered	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces (Nominal)

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports (Nominal)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
North African low phos	7.00
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	8.00
Spanish, North African basic, 50 to 60%	7.00
Tungsten, spot, short ton unit, duty paid	$ 9.75 to 10.00
Newfoundland fdy., 55%	7.00
*Chrome ore, 48% gross ton c.i.f.	$15.50 to 16.50

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	nominal
South African, 52%	18 to 19 cents
South African, 49-51%	nominal
South African, 44-47%	nominal
Indian, 48-50%	nominal
Brazilian, 46-48%	17 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
*Missouri	32.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Md.	25.00 to 30.00
*Missouri	26.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala	50.00

MAGNESITE BRICK

Per Net Ton

Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	38.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82%, tidewater, duty paid	$68.00
Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
Ferrosilicon, 50 per cent, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120.00 to 130.00
Silicomang., 2½% carb.	85.00
2% carbon	90.00
1% carbon	100.00
(The above for spot carlots. Contract price $5 a ton less.)	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, for spot delivery	10.00
Ferrotungsten, stand., lb. cont.	0.94 to 1.00
Ferrovanadium, 35 to 40 per cent, per lb. contained, on analysis	2.60 to 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent, per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

†Carloads. Differentials apply to quant.

Fluorspar

85 and 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton car loads	$10.50
Washed gravel, import duty paid tide, gross ton	16.50

Pig Iron

Shipments Continue on Up Grade—Two Merchant Stacks in Valleys Now Active

PIG IRON PRICES, PAGE 36

Pittsburgh—The merchant pig iron trade here has shown no significant trend since Jan. 1. The Shenango Furnace Co. stack resumed Jan. 9 on bessemer iron. The Davison Coke & Iron Co. stack also is operating, so two merchant furnaces in this and the valley district now are active. Vang Construction Co., Pittsburgh, general contractor for the Allegheny river No. 2 and No. 3 locks, has placed an order with the Pittsburgh Steel Foundry Co., Glassport, Pa., for 700 tons of armor castings. One steel casting firm reopened last week after being idle several weeks, although the roll makers in this district are finding business slow. Cleveland iron continues to move into this district and sharp competition makes $15, Pittsburgh district furnace, on all grades but basic, nominal. The open-hearth department of Follansbee Bros. Co. at Toronto, O., is expected to reopen Jan. 20 and it is probable some iron will be required.

Boston—Sales and inquiries continue small. A wide range of prices prevails, from $16.50, furnace, for Everett, Mass., iron, to close to $13 delivered, for Dutch. A few small lots of Buffalo iron from Beacon, N. Y., have been sold at $17.75 to $18.15, delivered. Eastern Pennsylvania iron is offered at $15.50, delivered.

Philadelphia — Post-inventory influences are reflected in pig iron, with an increasing volume of orders ranging from carlots to 300 tons. Prices are unchanged, except for reductions in low phosphorus iron. Approximately 500 tons of Japanese iron arrived here recently in addition to 200 to 300 tons in December. One thousand tons of Indian iron also arrived for distribution on existing orders. The local plant of Westinghouse Electric & Mfg. Co. will build for the Philadelphia Electric Co. a condenser, requiring about 100 tons of castings.

Frank Samuel & Co., Philadelphia, is low on 100 tons of low phosphorus iron for Panama with a bid of $2480, delivered. The navy has bids on 80 tons of foundry iron, an eastern Pennsylvania furnace bidding $13.30 for delivery of 35 tons to Philadelphia, and $15.28 on 45 tons for Washington, bids Jan. 10.

New York—Pig iron sellers look for an appreciable pickup over the last half of this month, with foundries increasing operations. Buying is spotty, with car lots the rule. Buffalo iron is unchanged at $14, furnace, and eastern Pennsylvania iron at $12.50 to $13, furnace.

Buffalo — Deliveries during the first half of January show a substantial gain over those in either half of December. The American Radiator & Standard Sanitary Corp.'s malleable plant here is on a 6-hour, 4-day schedule. Other melters also are consuming slightly more iron than their averages for the third quarter of last year.

Cincinnati — Shipments of pig iron have improved, especially to foundries on automotive work, but new business is scarce. Sales of 500 tons in carload lots were reported during the week.

Cleveland—Shipments continue to increase moderately, the improvement being due almost entirely to automotive foundry requirements. A lake interest serving the Michigan automotive industry booked 1500 tons in additional orders during the week. In Cleveland and nearby territory sales recently have dropped to occasional carloads. Inquiries are light. The base price for local delivery is nominal at $15, while in outside competitive territory $13.50 to $14.50 generally represents the market.

Chicago—Pig iron shipments are maintaining a moderate increase over the December rate. Smaller consumers are more active in purchasing but tonnage is light. Shipments to automotive interests are holding at about the December rate. Consumption by some farm implement manufacturers is moderately heavier than in December. Prices generally are firm at $15.50, furnace, for No. 2 foundry and malleable.

St. Louis—The leading local producer reports pig iron shipments this month 20 per cent ahead of the same period of December.

Ferroalloys More Active

Ferroalloy Prices, Page 36

Specifications for ferromanganese have improved, reflecting better steelmaking operations. Prices are unchanged at $68, duty paid. Domestic spiegeleisen, 19 to 21 per cent, is steady at $24, furnace, on spot lots, with contract prices subject to individual negotiation.

Coke

Steady Movement in Middle West, with Favorable Trend, Indicates Gain for Month

COKE PRICES, PAGE 36

Pittsburgh — Metallurgical coke still is inactive. Prices show no change, $1.75 quoted on beehive furnace coke, Connellsville ovens, and common grades of beehive foundry $2.50 up to $2.75. Premium brands now are best represented at $4 against a former nominal $4.25. The Heckla Coal & Coke Co., Pt. Marion, Pa., now operating 80 ovens will shortly light 50 more.

New York—Further increase is noted in specifications for metallurgical coke, reflecting better operations at foundries in this district. Prices are unchanged.

Cincinnati — Demand for domestic by-product coke continues active but foundry grades are dull.

Chicago—Shipments of foundry coke are fairly steady and although little change is noted from the December rate, gradual improvement in operations may bring about another increase in the total movement this month. Foundry coke continues $7, ovens, for outside delivery, and $7.75, delivered Chicago.

St. Louis—A leading east-side steel mill idle for several months will resume operations shortly, and another which has been on reduced schedule since the holidays will resume part time Jan. 23, these developments leading to better demand for metallurgical coke. Open market buying, only as fuel is actually required, is anticipated this year, few contracts having been closed.

Birmingham, Ala.—Furnace and foundry coke demands are light, but domestic fuel is moving in good volume. Oven operations in this district continue at the same rate as for several weeks.

Scrap

Heavy Steel Shows Strength in Eastern Centers—Market Generally Dull, Demand Small

Chicago—No scrap purchases are being made and dealers gradually are completing shipments against small tonnages outstanding against orders. While some new business is anticipated shortly, most mills prefer to defer large commitments until actual necessity. Scarcities are developing in some grades, due to unwillingness of railroads to sell at present prices and in some instances sharply higher quotations have developed under urgent necessity for material. Heavy melting steel nominally is unchanged at $5 to $5.50.

Boston—Scrap continues dull and while prices are untested, quotations are barely steady and in some instances nominal. Negotiations are on for some additional domestic water shipments of No. 1 steel,

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to 8.00
Boston, dealers	2.75 to 3.00
Buffalo, No. 1	7.00 to 7.50
Buffalo, No. 2	6.00 to 6.50
Chicago	5.00 to 5.50
Cleve., No. 1	7.00 to 7.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 deal.	4.50 to 5.00
Det., No. 2 deal.	3.00 to 3.50
E. Pa. del. mill	6.50
E. Pa., No. 2 del.	5.00 to 5.50
N. Y., deal. R. R.	4.50 to 4.75
N. Y. deal. No. 2	3.00
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.25 to 8.75
St. L. No. 1 sel.	5.50 to 6.00
Federal, Ill.	4.75 to 5.25
Granite City, Ill.	5.00 to 5.50
Valleys, No. 1	8.50 to 9.00

COMPRESSED SHEETS

Buffalo, dealers	6.00 to 6.50
Chi. (Factory)	3.75 to 4.00
Cleveland	6.50 to 7.00
Detroit, dealers	4.00 to 4.50
E. Pa. new mat.	5.00 to 5.50
Pittsburgh	7.75 to 8.25
Valleys	8.00 to 8.50

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cincinnati, del.	4.00 to 4.50
Cleveland	4.50 to 5.00
Eastern, Pa.	5.00
Pittsburgh	6.75 to 7.25
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to 2.50
Cincinnati	1.50 to 2.00
Detroit, dealers	1.25 to 1.75
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	2.75 to 3.00
Buffalo	9.50 to 10.00
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cincinnati, del.	9.00 to 9.50
Detroit, deal.	8.00 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.00 to 11.00
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.00 to 5.50
Boston, realers	2.00 to 2.50
Buffalo	7.50 to 7.75
Chicago, net	5.00 to 5.50
Cinci., deal. net	3.50 to 4.00
Det., net deal.	2.50 to 3.00
Eastern, Pa.	6.00
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	8.50 to 9.00
Chicago	6.50 to 7.00
Eastern Pa.	8.50
Pittsburgh	8.50 to 9.00
St. Louis	5.25 to 6.25

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	5.75 to 6.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	8.50 to 9.00
Cleveland bil. and bloom crops	10.00 to 11.00
Eastern Pa.	8.50
Pittsburgh billet bloom crops	10.00 to 10.50
Pitts., sheet bar crops	10.00 to 10.50

FROGS, SWITCHES

Chicago	5.00 to 5.50
St. Louis	5.00 to 5.50

SHOVELING STEEL

Chicago	5.00 to 5.50
Cleveland	5.75 to 6.00
St. Louis	4.75 to 5.25

RAILROAD WROUGHT

Birmingham	7.50 to 8.00
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	4.50 to 5.00
Buffalo, No. 2	7.00 to 7.50
Cinci., No. 2	5.00 to 5.50
Chi., No. 1, net	4.50 to 5.00
Chicago, No. 2	5.00 to 5.50
Eastern Pa.	6.50
N. Y., No. 1, deal.	2.50 to 3.00
Pitts., No. 2	8.25 to 8.75
St. Louis, No. 1	3.50 to 4.00

SPECIFICATION PIPE

Boston	3.00 to 4.00
St. Louis	4.75 to 5.25
Eastern Pa.	7.00 to 7.50
N. Y., deal	2.00 to 2.25

BUSHELING

Buffalo, No. 1	6.00 to 6.50
Chicago, No. 1	3.50 to 4.00
Cinci., No. 1 dl.	4.00 to 4.50
Cinci., No. 2	2.50 to 3.00
Cleve., No. 2	3.00 to 3.50
Det., No. 1 new deal.	3.25 to 3.75
St. L., No. 1	3.00 to 3.50
Val. new No. 1	8.50 to 8.75

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	0.75 to 1.00
Buffalo	3.75 to 4.25
Chicago	3.00 to 3.50
Cinci., deal	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit	1.25 to 1.75
Eastern Pa.	3.00 to 3.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	6.25 to 6.75
St. Louis	1.50 to 2.00
Valleys	6.25 to 6.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	0.75 to 0.90
Buffalo	3.50 to 3.75
Cinci., deal	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	1.75 to 2.25
Eastern Pa.	3.50 to 3.75
N. Y., deal.	1.35 to 1.50
Pittsburgh	5.75 to 6.25

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.25 to 4.50
Chicago	3.00 to 3.50
Cinci., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	1.75 to 2.25
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.50
N. Y., deal.	1.00 to 1.50
Pittsburgh	5.75 to 6.25
St. Louis	2.00 to 2.50

PIPE AND FLUES

Cinci., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.00 to 4.50
Chicago, net	5.00 to 5.50
Cincinnati	4.00 to 4.50
Eastern Pa.	5.50 to 6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.00 to 2.50
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	6.00 to 6.50
Detroit	2.75 to 3.25

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	6.50 to 7.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	3.50 to 4.00

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.25 to 6.75
Chi., elec. fce.	5.00 to 5.50
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.00
Pittsburgh, O. H.	7.00 to 7.50
St. Louis	3.00 to 3.50

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship pt.	6.00 to 6.50
Buffalo	10.00 to 10.50
Chicago, net	8.50 to 9.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship pt.	6.50 to 7.00
N. Y., deal.	5.50 to 6.00
St. Louis	7.50 to 8.00
E. Penna.	11.00 to 12.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	3.25 to 3.50
Buffalo, iron	7.00 to 8.00
Buffalo, steel	8.50 to 9.00
Chicago, iron	7.50 to 8.00
Chi., rolled steel	7.00 to 7.50
Cincinnati iron	6.25 to 6.75
E. Pa. steel	8.50 to 9.00
E. Pa. iron	8.50
Pitts., iron	7.50 to 8.00
Pitts., steel	8.50 to 9.00
St. Louis, iron	4.75 to 5.25
St. Louis, steel	6.00 to 6.50

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Buffalo (Mach.)	9.75 to 10.25
Buffalo, cupola	9.00 to 9.50
Boston, textile	6.75 to 7.00
Boston No. 2	2.25 to 2.50
Chi., mach. net	5.75 to 6.25
Chi., railroad net	6.00 to 6.50
Chicago, agri., net	5.00 to 5.50
Cinci., mach. cup	7.00 to 7.50
Cleve. cupola	7.00 to 8.00
Det., net deal.	6.50 to 7.00
E. Pa. cupola	9.00 to 9.50
N. Y., cup. deal.	4.50 to 5.00
N. Y., del. local foundries	7.00 to 7.50
Pitts., cupola	8.50 to 9.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1 ma.	6.00 to 6.50
St. L. No. 1	5.50 to 6.00

HEAVY CAST

Boston, del.	3.25 to 3.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break.	6.50 to 7.00
Cleve., break	5.50 to 6.00
Detroit, auto net deal.	7.00 to 7.50
Det. break., dl.	4.00 to 4.50
Eastern Pa.	8.00
N. Y. No. 1, dl.	4.50 to 5.00
N. Y. break, dl.	4.00 to 4.50
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston, consum.	7.00 to 7.50
Buffalo	8.00 to 8.50
Chicago, agri.	5.00 to 5.50
Chicago, R. R.	5.50 to 6.00
Cinci., R. R., del.	6.50 to 7.00
Cinci., agri. del.	6.00 to 6.50
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 5.50
St. Louis	7.00 to 7.50

RAILS FOR ROLLING

5 feet and over

Birmingham	8.00 to 9.00
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	8.00 to 8.50
Eastern Pa.	9.50
New York dealer	3.75 to 4.25
St. Louis	7.00 to 7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to 7.50
St. L., No. 1	5.00 to 5.50

LOW PHOS. PUNCHINGS

Chicago	7.50 to 8.00
Buffalo	9.00 to 9.50
Eastern Pa.	8.50
Pittsburgh	9.50 to 10.00

cleaned auto blocks and No. 2 steel for export. No. 1 cast has brought $6.50, delivered, for a small lot in this district. No. 1 continues at $5, delivered, Worcester, while other grades for that point are unchanged.

New York—No. 1 steel scrap is firmer, one dealer paying $4.75, barge, an increase of 25 cents a ton. Three sellers are loading No. 1 and No. 2 steel for export, and while $3, barge, is officially unchanged for the latter grade, scrap is coming out slowly, and the market is firmer.

Philadelphia—In addition to 500 tons of No. 2 melting steel, previously noted, an eastern Pennsylvania plate maker has closed on 500 tons of heavy breakable cast at the going price of $8, delivered. Stove plate has been marked down nominally to $6, delivered, but resistance to further concessions on various grades is becoming somewhat stronger. Demand as a whole is slightly better than a week ago.

Substantial shipments of No. 1 steel for Japan continue to move out of Baltimore. This scrap is coming from the 127 or so merchant ships of the United States Shipping board.

Buffalo—A district melter has purchased about 2000 tons of No. 1 heavy melting steel, at $7.25 to $7.50, according to dealers. Efforts to maintain an $8 minimum failed when one dealer quoted 50 or 75 cents less and established a going price which others sharing in the order were compelled to accept. There has been no buying yet by other principal melters here. Word has gone out from Lackawanna indicating large stocks there, but dealers discount these and look for Bethlehem to make a purchase within 30 days. Dealers are quoting $7.75 on stove plate, anticipating buying.

Pittsburgh — Marking the first increase since October, heavy melting steel was advanced 25 cents here the middle of last week. The increase is not substantially supported in view of the fact that offers to sell at $8 or $8.25 appear fairly prevalent. The sale proving the basis for this advance was for Vandergrift, Pa., at $8.50 for No. 1 heavy melting steel and $9 for railroad heavy melting steel.

Cleveland—Steel and iron scrap reflects slightly better shipments, particularly in busheling and borings for blast furnace use. Local yards are short of heavier grades since collectors are unable to work profitably at present prices.

Cincinnati—Prices of iron and steel scrap remain practically unchanged although weakness has crept in because of prolonged absence of tonnage buying.

Detroit—Iron and steel scrap prices are unchanged on the basis of $4.50 to $5 on heavy melting steel and $4 to $4.50 on compressed sheets. There is little evidence of weakness in the market. Considering the increase in automobile production, offerings of scrap by automobile manufacturers have not expanded commensurately.

St. Louis—The iron and steel scrap market has failed to emerge from the holiday lethargy, and generally the situation duplicates that of the closing weeks of last year. Dealers are shipping small quantities on orders, but the total due on outstanding contracts is light and the movement is steadily contracting.

Birmingham, Ala.—No change is seen in scrap iron and steel and movement is light. Quotations are the same as before the holidays.

Toronto, Ont.—Trading in iron and steel scrap is spotty. Steel mills are out of the market in the Ontario district, with minor demand in Montreal. Iron grades are showing some activity in machinery cast and other lines.

Sheet Bar Demand Better

Semifinished Prices, Page 36

Due to improvement in tin mill operations, demand for sheet bars has improved. The same can not be said of open market transactions either in sheet bars or billets, as nonintegrated mills are specifying little.

Prices are steady at $26 for sheet bars, billets and slabs, base, Pittsburgh, Youngstown, O., and Cleveland. Forging billets are $31 and wire rods $37.

Equipment

Pittsburgh Builder Books Large Order for Mill Units

New York—Inquiry for machinery is heavier and a slight increase in sales is noted. An eastern Pennsylvania locomotive builder's subsidiary, reported about to enter the air refrigeration field, is taking figures on a list of equipment. Japanese buyers in this district continue to purchase for an aircraft shop and are expected to close on a substantial lathe order for crankshaft work soon. Builders of refrigeration units are inquiring for tools, also at least one maker of marine equipment. Some dealers and builders view the present outlook as the best in several months. There has been a slump in immediate government shop inquiry, although bids went in last week for two shapers and a lathe for the department of agriculture, Washington.

Worcester, Mass. — Inquiry for machinery is unchanged from the recent dull rate, increase in activity being noted only in spots where a few shops have booked some foreign business. General industrial demand is slow and little equipment is being figured, tentative budgets for machinery being unprepared. Operating schedules vary widely, but most shops are greatly curtailed.

Pittsburgh — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was awarded a $110,000 order last week for mill motors ranging from 250 to 1200 horsepower, control apparatus and auxiliary steel mill equipment by a large sheet steel manufacturer. At the same time the company received orders for maintenance work in several steel mills, including some business from a cold strip producer.

Makers of heavy steel mill equipment including rolling mills, have difficulty obtaining releases on considerable pending work. One such maker here has valid pending work of over $10,000,000 which it has figured but is unable to get releases on any part of it. The extent of activity in the heavy equipment market is confined to minor repairs and negligible improvements.

Cleveland—Current activity in machinery and equipment lines continues depressed. A meter manufacturer, selling to the steel, power and allied industries, reports outlook for the next two months as unencouraging. Lack of plant expansion and the absence of new industries are forcing equipment manufacturers to concentrate almost solely on the economy argument for replacement sales. A Dayton builder is low on two screw machines for Wright field.

Chicago—Sales of machinery and plant equipment continue slow and what occasional gains are noted in activity fail to be maintained. Purchases by railroads and steel companies are particularly light with a number of leading carriers yet to prepare budgets for 1933.

One of the most active industries as regards new construction and equipment is the brewing industry. Expenditures of about $2,000,000 are involved in projects planned by various interests in Chicago, about half of which sum is required for work already under way.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.50c, Conn., for copper

SHEETS	
Yellow brass (high)	11.00
Copper, hot rolled	13.62½
Lead sheets, cut, to jobbers	**7.00**
Zinc sheets (100-lb. base)	**9.00**
TUBES AND PIPES	
Seamless yellow brass (high)	13.25
Seamless copper	12.37½
RODS	
Yellow brass (high, full turning)	8.50
Naval brass	9.62½
ANODES	
Copper, untrimmed	10.50
WIRE	
Yellow brass (high)	11.00

Old Metals

Dealers' buying prices, cents lb. No. 1 Composition· Red Brass

New York	2.62½ to 2.75
Chicago	2.12½ to 2.25
Cleveland	2.25 to 2.50
St. Louis	2.25
HEAVY YELLOW BRASS	
New York	**1.87½ to 2.00**
HEAVY COPPER AND WIRE	
New York	3.50 to 3.75
Chicago, No. 1	3.00 to 3.12½
Cleveland	2.75 to 3.00
St. Louis	2.50
COMPOSITION BRASS BORINGS	
New York	2.37½ to 2.50
YELLOW BRASS TUBING	
Cleveland	1.50 to 1.75
LIGHT COPPER	
New York	2.62½ to 2.75
Chicago	2.12½ to 2.25
Cleveland	2.25 to 2.50
St. Louis	2.25
LIGHT BRASS	
Chicago	1.12½ to 1.25
Cleveland	1.00 to 1.25
St. Louis	1.25
LEAD	
New York	2.00 to 2.25
Cleveland	1.50 to 2.00
St. Louis	2.00
ZINC	
New York	1.12½ to 1.25
Cleveland	1.00 to 1.12½
St. Louis	1.25
ALUMINUM	
Clippings, new, soft, Cleve.	9.50 to 10.00
Clippings, hard, Cleveland	6.00 to 7.00
Borings, Cleveland	2.50 to 3.00
Mixed cast, Cleveland	4.00 to 5.00
Mixed cast, St. Louis	4.00 to 4.25

Secondary Metals

Brass ingot, 85-5-5-5	5.25
Remelt aluminum No. 12	8.00 to 9.00

Metals

Copper Shows Advance Abroad But Is Dull Here—Easiness Develops in Zinc—Tin Rises

New York — Demand for metals was quiet last week. Quotations were relatively steady with the exception of an advance in tin and antimony and a slightly easier situation in zinc.

Copper—Consumers continued to display little interest in copper, apparently being well protected for current restricted needs and not desiring to book metal too far ahead in view of the uncertainty in the market and the clouded business horizon. Domestic prices, however, maintained a firm appearance with custom smelters still quoting 5.00c, Connecticut, for first quarter shipment and 5.12½c for second quarter. Mine producers held aloof from the market at the entirely nominal quotation of 6.25c, Connecticut, but were understood to be applying 5.50c on transactions with fabricating affiliates. Buying abroad was more active and metal sold at as high as 5.25c, c.i.f. European ports. This had a somewhat strengtbening effect on domestic prices. Brass ingot was cut ¼-cent on all grades except yellow which was reduced ⅛-cent. Products held unchanged.

Lead—Quotations held firm at 2.87½c, East St. Louis, and 3.00c New York, despite only fair buying. Consumers are understood to have much metal to purchase for the remainder of January.

Zinc—Most sellers asked 3.10c, East St. Louis, through the week for prime western metal but one first-hand seller came into the market late in the period with offerings at 3.05c. As the week closed, it was reported that metal might be purchased on bids at 3.00c for January and February and at 3.07½c for March.

Antimony—Prices jumped sharply on the report that Chinese exports would be taxed 10 per cent. No Chinese metal was offered Friday but domestic metal could be had at 5.80c.

Tin—Strength in Wall Street and the exchange on pound sterling together with a stronger tin market in London brought Straits metal up 22.90c near the middle of the week. Lower prices developed near the close of the period.

Distillates More Active

New York—Specifications for distillates on contracts have stepped up following inventories and spot demand also is slightly heavier. The chemical industries are taking benzol in better volume. Toluol is more active with the lacquer makers. Prices are firm and output continues restricted. Industrial demand for phenol has picked up.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	**$0.20**
90 per cent benzol	**0.20**
Toluol	**0.30**
Solvent naphtha	**0.26**
Commercial xylol	**0.26**

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	**0.153 to 0.173**

Per Pound at Producers' Plants

Naphthalene flakes	**4.75 to 5.75**
Naphthalene balls	**4.75 to 5.75**

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.10

Quicksilver Steady

New York — While some sellers feel that increased buying of quicksilver will develop soon, the market has remained quiet. Prices are unchanged, with round lots $48, a virgin flask of 76 pounds and small lots $49 a flask, for spot delivery.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper Electro., del. Conn.	Copper Lake, del. Midwest	Copper Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Jan. 7	5.00	5.12½	4.75	22.37½	22.60	3.00	2.87½	3.10	22.90	5.45	35.00
Jan. 9	5.00	5.12½	4.75	22.50	22.72½	3.00	2.87½	3.10	22.90	5.45	35.00
Jan. 10	5.00	5.12½	4.75	22.70	22.92½	3.00	2.87½	3.10	22.90	5.45	35.00
Jan. 11	5.00	5.12½	4.75	22.90	23.12½	3.00	2.87½	3.10	22.90	5.70	35.00
Jan. 12	5.00	5.12½	4.75	22.85	23.05	3.00	2.87½	3.05	22.90	5.75	35.00
Jan. 13	5.00	5.12½	4.75	22.50	22.65	3.00	2.87½	3.05	22.90	5.85	35.00

Very hard wire takes an *edgewise bend*

and retains its original properties

Have you ever seen tempered high carbon steel flatwire that could be wound edgewise with a pitch to it...and yet retain its original properties? It takes *some steel* to stand that...steel that has great strength, with a high degree of toughness and ductility. And it takes a deep knowledge of heat-treating and tempering, plus exceptional care throughout production to produce such steel.

This spiral section demonstrates Roebling's ability to handle the difficult jobs...to meet unusual and very exacting specifications. If you have a flat wire "worry", or require wire of highest quality, come to Roebling. We specialize on high quality cold-rolled high and low carbon flats, and we are particularly well-equipped to make high carbon "flats", tempered or untempered.

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Wire · Wire Rope · Copper & Insulated Wires & Cables
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New York Boston Chicago Philadelphia Atlanta Cleveland Seattle
San Francisco Los Angeles Portland Export Dept., New York, N.Y.

ROEBLING FLAT WIRE

Europe

British Pig Iron Output Gains But Steel Recedes—General Conditions Look Much Better

London—(*By Radio*)—British pig iron interests made a decided gain in production in December with a total of 284,000 tons, compared with 267,700 tons in November. The daily rate was 9161 tons in December, 8923 in November. Sixty stacks were in blast at the end of the month. Steelmakers did not do so well and production in December was 435,000 tons, according to estimate, compared with 473,800 tons in November.

Better export business is indicated by larger shipments and further expansion is expected, especially to Scandinavian countries. Domestic steel trade shows a slight gain, especially in the Middlesbrough district. Tin plate prospects are much brighter. The Continent reports trade quiet but prospects are better for substantial tonnages to the Far East. Prices are firm.

Progress is being made in putting the steel industry on better basis in Great Britain, and future conditions will be met with better facilities.

Pacific Coast

Small Lots Rule and Market Is Generally Dull

San Francisco—(*By Air Mail*)—The largest award currently went to the Central Foundry Co., 610 tons of 6-inch universal pipe for San Francisco. Little real business is looked for during the next thirty days. West Slope Construction Co., Chicago, has been awarded the contract for San Gabriel dam No. 1, Los Angeles county, California, involving the placing of 3838 tons of reinforcing bars. No particular change in price has occurred recently, although the out-of-stock price on reinforcing bars in the Los Angeles and San Francisco district is weak at around 2.00c base, on carload lots.

Only two awards of importance were noted in the concrete bar market. Unnamed interests took 200 tons for the Wm. Land school, Sacramento, Calif., and 163 tons for two bridges in San Diego county, Calif., for the state. Bids have been opened on 250 tons for two bridges in Los Angeles county, California, on 157 tons for highway work in Monterey county, Calif., and on 117 tons for a bridge over the San Gabriel river at Long Beach, Calif. New Inquiries include 365 tons for highway work in San Bernardino county, California, and 164 tons for highway work in Clark and Pershing counties, Nevada.

Consolidated Steel Corp., Los Angeles, was awarded, through Foster Wheeler Corp., N. Y., 200 tons of plates for four boilers for Mare Island, Calif. No other awards of note were reported. Prices continue unchanged at 2.00c, c.i.f.

Seattle Market Dull

Seattle—The turn of the year finds the Pacific Northwest still suffering from holiday apathy. Unfavorable weather conditions are retarding outside work. Several public works projects have been postponed. This is true of Seattle's waterfront improvement, to cost $1,200,000 and involving nearly 7500 tons of sheet steel piling and reinforcing. Bids were to have been opened Jan. 11 but have been extended to March 15 in the expectation the state legislature will assume part of the cost.

Lindstrom & Feigenson Co., Portland, Oreg., are low at $59,741 for constructing five bridges in Whatcom county, Washington, for United States bureau of roads. About 260 tons of shapes and concrete bars are involved. Harnischfeger Sales Corp., Milwaukee, is low at $41,840 for a 10-ton traveling gantry crane for the Puget Sound Navy yard.

Warrack Construction Co., Seattle, is low bidder at $8399 for a hand-operated traveling crane and structural steel runway for the lighthouse department, Ketchikan, Alaska.

Wholesale jobbers report conditions unimproved since the first of the year. Prices of special iron sheets have been reduced to the following levels: galvanized, 6c; black 5.40c; blue annealed, 4.70c; plates, 4.40c; corrugated 6.17c; No. 24 7.56c. Reports from Portland state that jobbers have been unable to agree on a firm price schedule and conditions are unchanged. In the Seattle district, firm prices continue in effect.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 11

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$ 9.83	2 18 6	$8.27	1 14 0
Basic bessemer	9.07	2 14 0*	6.57	1 7 0
Hematite, Phos. .03-.05	9.91	2 19 0	.....	.....
SEMI-FINISHED STEEL				
Billets	$16.38	4 17 6	$9.61	1 19 6
Wire rods, No. 5 gage	25.20	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$26.04	7 15 0	$26.77	5 10 0
Merchant bars	.94c	6 5 0	.52c to .53c	2 7 6 to 2 8 0
Structural shapes	1.11c	7 7 6	.46c	2 1 6
Plates, ¼ in. or 5 mm	1.31c	8 15 0	.63c to .64c	2 17 0 to 2 18 0
Sheets, black, 24 gage or 0.5 mm.	1.28c	8 10 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	1.58c	10 10 0	1.49c	6 15 0
Bands and strips	1.16c	7 15 0	.77c to .80c	3 10 0 to 3 12 6
Plain wire, base	1.43c	9 10 0	1.18c	5 7 6
Galvanized wire, base	1.73c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.65c	11 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 2.69	0 16 0	$3.20	0 13 2

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$ 9.83	2 18 6	$ 8.00	205	$ 8.31	300	$14.97	63
Basic bessemer pig iron	9.07	2 14 0*	6.24	160	7.76	280	16.51	69.50
Furnace coke	2.27	0 13 6	4.84	124	3.05	110	4.56	19.20
Billets	16.80	5 0 0	14.43	370	10.11	365	22.93	96.50
Standard rails	1.24c	8 5 0	1.25c	697	1.50c	1,150	1.37c	127
Merchant bars	1.01c	6 15 0	.95c	530	.64c	495	1.19c	110
Structural shapes	1.31c	8 15 0	.99c	550	.63c	485	1.16c	107.50
Plates, ¼-in. or 5 mm	1.35c	9 0 0	1.17c	650	.75c	575	1.37c	127
Sheets, black	1.39c	9 5 0§	1.44c	800‡	.91c	700‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	1.69c	11 5 0	2.83c	1,570	1.82c	1400	4.00c	370
Plain wire	1.43c	9 10 0	2.03c	1,130	1.69c	1,300	1.92c	178
Bands and strips	1.43c	9 10 0	.90c	500	.81c	625	1.37c	127

*Basic. †British ship-plates, Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.

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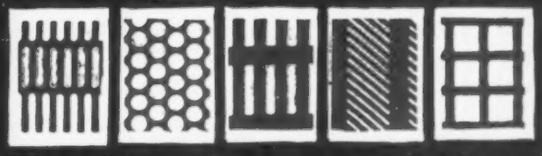

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WEIRTON. W. VA.
Division of National Steel Corporation
Sales Offices in All Principal Cities

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
¼ & ⅜	57	34	½	28	10½
½	62	49½	¾	33	16½
¾	65½	55	1—1¼	36	20½
1—3	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD

Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7	+41
¼ & ⅜	53½	38½	½	28	12½
½	59	49½	¾	33	17½
¾	63½	54	1—2	39	23

LAP WELD

Extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½—4	39	25
5 & 6	62	52½	4½—6	38	24
8	58	47	7 & 8	36	22
10	51½	40½	9—12	26	13½
12	50½	39½			

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts are net.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, in next column. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. .....$32.00 to 33.00
Four-inch, Birmingham .... 35.00 to 36.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y..... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $90.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $3 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(▲All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3 25c

IRON BARS

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3 25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.45c
Chattanooga	3.50c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
New York	3.00c
Portland	4.00c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.45c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.75c-4.00c
Phila.*†(e)	3.40c
Pitts.**	3.20c-3.40c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.05c
Chattanooga	3.95c
Chicago	3.50c-3.75c

††Base 15,000 lbs., extras on less.

Cincinnati	3.90c
Cleveland	3.75c
Detroit	3.75c
Houston	3.57c
Los Ang.	4.50c
New York	4.00c-4.10c
Phila.*†(e)	3.75c
Pitts.**	3.90c-4.00c
Portland	5.00c
San Fran.	4.55c
Seattle	5.00c
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL

Rounds and Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York(g)	3.54c
Philadelphia*	3.35c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran(d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles.

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LATROBE ELECTRIC STEEL CO.
LATROBE, PA.

STATISTICS OF IRON AND STEEL INDUSTRY

Compiled by department of commerce, except: Unfilled tonnage by United States Steel Corp.; foundry equipment orders by Foundry Equipment Manufacturers association; river traffic by United States engineer at Pittsburgh.

Automobiles

1931	Units Production —United States— Total*	Passenger cars	Canada Total
Nov.	68,867	48,185	1,247
11 Mo.	2,268,197	1,874,302	80,189
Dec.	121,541	96,753	2,432
Yr.	2,389,738	1,967,055	82,621
1932			
Jan.	119,344	98,706	3,731
Feb.	117,413	94,085	5,477
Mar.	118,959	99,325	8,318
April	148,326	120,906	6,810
May	185,149	151,683	8,221
June	183,092	160,103	7,112
July	111,141	94,678	7,472
Aug.	90,324	75,898	4,067
Sept.	84,141	64,735	2,342
Oct.	48,702	35,102	2,923
Nov.	59,556	47,293	2,204
11 Mo.	1,265,287	1,048,514	58,667

*Difference of total and passenger cars equals number of trucks. †Average monthly shipments, 1922-23-24 taken as 100.

Fabricated Shapes

1931	Net Tons Bookings Tonnage	Per cent of capacity	Shipments Tonnage	Per cent of capacity
Nov.	90,800	22.7	111,600	27.9
11 Mo.	1,783,200	40.5	802,400	18.2
Dec.	97,600	24.4	122,800	30.7
Yr.	1,880,800	39.2	1,811,600	37.7
1932				
Jan.	48,400	12.1	65,600	16.4
Feb.	62,000	15.5	78,000	19.5
Mar.	64,400	16.1	82,400	20.6
April	64,800	16.2	68,400	17.1
May	90,800	22.7	72,400	18.1
June	86,800	21.7	83,200	20.8
July	69,200	17.3	83,600	20.9
Aug.	78,800	19.7	85,600	21.4
Sept.	111,200	27.8	90,800	22.7
Oct.	74,400	18.6	86,400	21.6
Nov.	51,600	12.9	76,000	19.0
11 Mo.	802,400	18.2	873,600	19.9

Fabricated Plates

1931	Net Tons Bookings Total	Oil Storage Tanks	Miscellaneous
Nov.	18,268	1,755	15,058
11 Mo.	286,067	36,568	199,959
Dec.	16,442	778	13,891
Yr.	302,509	37,346	213,850
1932			
Jan.	17,613	4,783	12,124
Feb.	17,755	4,115	11,777
Mar.	12,564	1,161	10,022
April	14,074	1,406	11,167
May	11,788	2,310	9,356
June	18,383	2,808	10,209
July	12,485	3,661	6,586
Aug.	11,916	4,394	6,911
Sept.	11,013	3,753	6,801
Oct.	16,737	5,941	9,528
Nov.	7,168	1,181	5,625
11 Mo.	151,592	35,563	103,111

Railroad Locomotives

1931	Units Shipments Domestic	Foreign
Nov.	7	..
11 Mo.	38	13
Dec.	2	..
Yr.	150	16
1932		
Jan.	..	..
Feb.	1	4
Mar.	..	3
April	8	0
May	13	2
June	17	..
July	9	..
Aug.	9	..
Sept.	9	4
Oct.	10	2
Nov.	8	..
11 Mo.	52	7

Foundry Equipment Order Index†

1931	
Nov.	17.2
11 Mo.	....
Dec.	26.3
Yr.	....
1932	
Jan.	20.5
Feb.	27.6
Mar.	27.5
April	13.7
May	18.0
June	14.2
July	18.7
Aug.	18.6
Sept.	11.9
Oct.	23.2
Nov.	13.8
11 Mo.	....

Malleable Castings

1931	Net Tons Output	Shipments	Orders booked
Nov.	17,984	18,336	18,971
11 Mo.	290,350	305,764	282,711
Dec.	21,503	20,206	19,811
Yr.	311,853	325,970	302,522
1932			
Jan.	22,216	21,572	22,036
Feb.	21,578	21,325	19,709
Mar.	19,597	21,337	18,046
April	16,758	18,328	17,630
May	17,430	18,953	17,297
June	15,143	16,503	13,512
July	9,703	11,554	8,881
August	7,038	8,879	7,992
Sept.	10,168	9,778	10,768
Oct.	12,586	11,926	13,049
Nov.	13,912	13,074	14,634
11 Mo.	166,129	173,229	163,554

Steel Castings

1931	Net Tons Total bookings	Total production
Nov.	20,001	23,139
11 Mo.	372,796	415,188
Dec.	20,799	22,064
Yr.	393,595	437,252
1932		
Jan.	17,393	18,395
Feb.	17,015	18,759
Mar.	16,593	20,433
April	12,801	17,474
May	11,342	14,463
June	12,765	12,839
July	9,301	11,460
August	10,147	12,331
Sept.	11,883	11,337
Oct.	11,896	12,480
Nov.	13,233	13,712
11 Mo.	144,317	163,826

Mechanical Stokers

1931	—Sales— Fire tube boilers	Water tube boilers
Nov.	170	36
11 Mo.	1,772	552
Dec.	117	22
Yr.	1,889	574
1932		
Jan.	70	45
Feb.	63	26
Mar.	60	23
April	80	15
May	41	30
June	65	48
July	70	44
August	99	38
Sept.	117	46
Oct.	96	21
Nov.	79	12
11 Mo.	842	347

Steel Furniture

1931	Dollars, 000 omitted Business shipments	Shelving, shipments
Nov.	956	226
11 Mo.	14,212	4,140
Dec.	1,075	298
Yr.	15,287	4,440
1932		
Jan.	977	269
Feb.	807	229
Mar.	780	259
April	753	190
May	653	196
June	671	177
July	521	155
August	543	141
Sept.	577	146
Oct.	622	142
Nov.	581	125
11 Mo.	7,490	2,031

Babbitt Metal

1931	Pounds 000 omitted (a) Total production	(b) Sales
Nov.	1,846	1,239
11 Mo.	24,395	17,390
Dec.	1,624	1,047
Yr.	26,020	18,438
1932		
Jan.	1,743	1,281
Feb.	1,577	1,142
Mar.	1,595	1,188
April	1,419	1,060
May	1,345	947
June	1,319	858
July	1,275	870
August	1,319	994
Sept.	1,406	1,108
Oct.	1,573	1,192
Nov.	1,265	944
11 Mo.	15,840	11,589

(a) by 40 plants. (b) by 30 manufacturers who produce for sale, including 5 who also report consumption of own metal.

Electric Power

1931	Millions Kilowatt Hours Production
November	7,406
11 Mo.	83,956
Dec.	7,773
Year	91,729
1932	
Jan.	7,543
Feb.	7,002
March	7,302
April	6,779
May	6,635
June	6,549
July	6,526
Aug.	6,743
Sept.	6,735
Oct.	7,053
Nov.	6,937
11 Mo.	75,804
Dec.	....

Coke

1931	Net Tons Production By-Product	Beehive
November	2,276,283	98,300
11 Mo.	30,220,607	1,191,900
Dec.	2,233,997	82,000
Year	32,454,604	1,273,900
1932		
Jan.	2,100,923	87,900
Feb.	1,995,780	85,800
March	2,089,391	87,400
April	1,883,391	56,000
May	1,742,517	45,000
June	1,536,712	41,200
July	1,523,422	38,200
Aug.	1,473,904	40,700
Sept.	1,544,491	45,700
Oct.	1,738,716	67,600
Nov.	2,276,283	98,300
11 Mo.	19,380,828	676,900
Dec.	....	....

Steel Barrels

1931	Units Production	Shipments
November	453,547	444,201
11 Mo.	5,692,492	5,626,845
Dec.	382,483	385,435
Year	5,984,975	6,010,280
1932		
Jan.	359,685	352,135
Feb.	367,472	369,882
March	452,294	453,621
April	447,379	452,191
May	427,299	425,662
June	651,916	654,561
July	352,614	353,336
Aug.	362,993	360,509
Sept.	395,640	398,241
Oct.	422,637	417,490
Nov.	373,190	376,647
11 Mo.	4,619,912	4,621,048
Dec.	.....	.....

River Traffic

1931	Net Tons Allegheny	Monongahela	Ohio
November	5	24,338	42,247
11 Mo.	20,877	426,183	653,063
Dec.	.....	21,360	51,138
Year	20,882	471,881	746,448
1932			
Jan.	.....	25,327	45,199
Feb.	2,200	20,089	40,737
March	550	32,234	33,254
April	501	23,849	32,972
May	2,550	23,941	28,267
June	3,611	18,291	27,306
July	1,400	13,677	22,895
Aug.	3,400	26,390	43,621
Sept.	1,200	18,831	28,557
Oct.	21,280	24,305	40,399
Nov.	23,225	29,851	45,735
11 Mo.	59,917	256,785	388,942
Dec.	.....	.....	.....

Unfilled Tonnage

1931	Tons United States Steel Corp. Unfilled orders	Net change	Per cent change
November	2,933,891	185,541—	5.94—
11 Mo.	.....	.....	....
Dec.	2,735,353	198,538—	6.77—
Year	.....	.....	.....
1932			
Jan.	2,648,150	87,203—	3.19—
Feb.	2,545,629	102,521—	3.88—
March	2,472,413	73,216—	2.87—
April	2,326,926	145,487—	5.88—
May	2,177,162	149,764—	6.44—
June	2,034,768	142,394—	6.54—
July	1,966,302	68,466—	3.36—
Aug.	1,969,595	3,293+	0.16+
Sept.	1,985,090	15,495+	0.78+
Oct.	1,977,040	11,950+	0.62+
Nov.	1,968,301	28,739—	1.45—
11 Mo.	.....	.....	....
Dec.	1,968,140	161—	0.01—

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BOSTON—Chadwick & Carr, 108 North street, Boston, has leased an 8-story building at 185 State street and will move its plant there in January. Its products are store fixtures and refrigerators. The company has another plant on Malden street, Boston.

BOSTON—Smith & Babcock Silverware Co. has started manufacture of silver plated ware and sterling silver ware at Faneuil station, Brighton, with about 10,000 square feet of space, with $25,000 capital. Lawrence D. Smith is president and Charles I. Babcock is treasurer.

LYNN, MASS.—Bay State Cutting Die Co. has started the manufacture of shoe-cutting dies at 380 Broad street, Lynn. H. April is president and H. Resnic, treasurer.

NEWTON, MASS.—Newton Meter Co. has started the manufacture of meters for use in connection with oil-burning equipment, at 63 Walnut street, Newton Lower Falls, Mass., with $50,000 capital, in a plant containing 7500 square feet floor space. Jacob B. Ribakoff is president and D. Allen is treasurer.

QUINCY, MASS.—H. G. Machine Co. has started operations at 11 Philip street, Neponset, Mass., manufacturing special machines and rebuilding machinery. C. Guy Hyland and Albert J. Gillissen compose the firm.

New York

NEW YORK—Gurney Elevator Co. has been incorporated and has taken over the assets of the Gurney Elevator Co. Inc., which has been under equity receivership for nearly a year. It has acquired all the property of the former company, its designs, patents and inventories and officers will be men associated with the old company for many years. No change will be made in products or policies. C. R. Callaway, vice president of the old company is president.

NIAGARA FALLS, N. Y.—Plant and business of the Bliss-Latham Co. has been bought by the Boston Wire Stitcher Co., which will move machinery and offices to its plant at East Greenwich, Conn. The local company manufactures machinery for bookbinding and boxmaking.

New Jersey

ELIZABETH, N. J.—Park Steel & Iron Co. has been incorporated with 450 shares no par value to manufacture steel products, by Matlack & Lautman, Asbury Park, N. J.

Pennsylvania

BRADDOCK, PA.—Sommerfield Co. has been incorporated with $5000 capital to manufacture iron and steel products, by John N. Piatt, 4805 Center avenue, Pittsburgh.

Ohio

CLEVELAND—Ace Engineering Co. has been incorporated with 250 shares no par value, by A. O. Husband, 1930 Standard Bank building, Cleveland.

CLEVELAND — Carpenter Metal Products Co. has been incorporated with 1500 shares no par value, by W. H. Seagrave, Williamson building, Cleveland.

CLEVELAND—Truscon Steel Co., as a result of orders for fabrication of $2,000,000 worth of electric refrigerator cabinets, will employ 300 to 500 additional men in its plant here most of 1933. Increased operations will start about Feb. 1, according to H. E. White, vice president.

TOLEDO, O.—Allen Filter Co., 25 South St. Clair street, suffered $45,000 damage by fire recently. Machinery and storage departments suffered most damage.

Michigan

DETROIT—Michigan Natural Gas Corp. plans construction of a 60-mile electric-welded steel pipe line from Mt. Pleasant to Saginaw and Bay City, Mich.

DETROIT—Davis-Grove Corp., New Center building, has been incorporated with 15,000 shares no par value to manufacture engines, machinery and devices, by George L. Davis, 10340 Oakland avenue, Detroit.

DETROIT—Active Pattern & Foundry Co. has been incorporated with 480 shares no par value to manufacture wood and metal patterns, by Henry R. Fangmeyer, 534 East Fort street, Detroit.

DETROIT — Department of public works will take bids until Jan. 20 for a pumping station at Southfield and Ford roads, Dearborn, Mich., for the cities of Dearborn and Detroit. Cost is estimated at $22,000.

DETROIT—Electric Motors Inc. has been incorporated with $50,000 capital to manufacture machinery and elec-

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trical supplies, with offices at 3315 Barlum Tower, by Ellene Ellis, 3565 Nottingham road, Detroit.

LAPEER, MICH.—City is considering plans for construction of a municipal electric power distributing system to cost about $200,000.

RIVER ROUGE, MICH. — Arthur Griege, city commissioner, proposes construction of a $250,000 municipal filtration plant.

TRAVERSE CITY, MICH.—City commission is considering plans for construction of a central heating system.

WYANDOTTE, MICH.—Froelich & Emery, Toledo, O., engineers, are taking bids for completion of a power plant at Wyandotte for the minicipal service commission. The cost is estimated at $100,000 and bids close Jan. 23.

Indiana

FORT WAYNE, IND.—Hoad, Decker, Shoecraft & Dewey, Ann Arbor, Mich., engineers, will take revised bids until Jan. 19 for a

Southern States

MOBILE, ALA.—United States engineers are having plans prepared for two steel barges, 100 x 24 x 7 feet.

Arkansas

CONWAY, ARK.—City council will call for bids soon for extensions and improvements and for power station including a 750-horsepower diesel engine generator unit and accessories, costing about $50,000.

FORT SMITH, ARK.—Boal Foundry & Machine Co. plans to rebuild part of its plant recently burned.

MALVERN, ARK.—Rock Port Minerals Inc. has plans for a new ore mining plant and concentrating mill near here for production of rutile and other mineral products. Equipment will include grinding, concentrating and other machinery. Investment will be about $40,000.

Wisconsin

FORT ATKINSON, WIS.—City commission has selected Robert Cramer, consulting engineer, 647 West Virginia street, Milwaukee, to take complete charge of construction of a new municipal sewage disposal project and improvements in the city water plant. A. J. Koenig is city manager.

LA CROSSE, WIS.—State engineers are completing plans for a new central heating plant at the La Crosse state teachers' college, estimated to cost $35,000. Contracts will be awarded early in February. G. M. Snodgrass is president of the college.

MANITOWOC, WIS.—Layne-Northwest Co., 1029 West Wells street, Milwaukee, is successful bidder at $31,885 for providing the city of Manitowoc a complete additional water supply unit.

MILWAUKEE—Milwaukee Gas Light Co. has announced a 1933 budget appropriation of $595,000 for new construction and maintenance. The Milwaukee Coke & Gas Co., an affiliate, will spend $164,000 for new construction.

WAUPACA, WIS.—Cary Mfg. Co., manufacturer of oil burners and other heating equipment, plans to rebuild its plant which was burned late in December with loss of $125,000 or more in buildings and machinery. Practically all precision machinery and other expensive equipment will require replacement. E. C. Cary is president.

Pacific Coast

ORANGE, CALIF.—Anaconda Wire & Cable Co. of California, H. Donn Keresey, president, is installing additional machinery at its plant here for the manufacture of bare and stranded copper conductors, as the result of a large order from the metropolitan water district of Southern California and expectation of large orders for the Hoover dam project.

Dominion of Canada

VICTORIA, B. C.—British Columbia Electric Railway Co. has placed orders for presurse equipment to serve 28 miles of proposed gas mains in the Greater Victoria area.

QUEBEC, QUE.—Joseph Nolin will start work soon on repair of the Wolfe Cove terminal for the Port of Quebec, for which the Dominion government has granted $87,000. It will employ 100 men through the winter.

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